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# **Final Environmental Impact Statement for the Introduction of the P-8A Multi-Mission Maritime Aircraft into the U.S. Navy Fleet**

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**Volume 1**

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**Prepared by:**

**United States Department of the Navy**

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**Responsible Agency:**  
**Department of the Navy**



In accordance with Chief of Naval Operations Instructions 5090.1C

**FINAL ENVIRONMENTAL IMPACT STATEMENT  
FOR THE INTRODUCTION OF THE P-8A  
MULTI-MISSION MARITIME AIRCRAFT  
INTO THE U.S. NAVY FLEET  
OCTOBER 2008**

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**Abstract**

The proposed action addressed in this Environmental Impact Statement (EIS) is to provide facilities and functions to support the homebasing of 12 P-8A MMA fleet squadrons (72 aircraft) and one fleet replacement squadron (FRS) (12 aircraft) at established maritime patrol home bases. Six alternatives and the No Action alternative were considered, which included the following installations: Naval Air Station Jacksonville, Florida; Naval Air Station Whidbey Island, Washington; Naval Air Station North Island, California; and Marine Corps Base Hawaii, Kaneohe Bay, Hawaii.

The EIS presents the environmental consequences associated with new aircraft, personnel transition, and new construction or renovation of structures to accommodate the basing of the P-8A MMA. It analyzes the potential impacts of the six alternatives and the No Action Alternative on air operations; noise; air quality; land use and coastal zone management; socioeconomic; transportation; infrastructure; topography, geology, and soils; water resources and wetlands; biological resources; cultural resources; and environmental contamination.

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## Acronyms and Abbreviations

AAQS	ambient air quality standards	CAA	Clean Air Act
ACHP	Advisory Council on Historic Preservation	CCD	Coastal Consistency Determination
ACTC	Air Traffic Control Tower	CCMP	California Coastal Management Program
AESO	Aircraft Environmental Support Office	CEQ	Council on Environmental Quality
AFB	Air Force Base	CEQA	California Environmental Quality Act
agl	above ground level	CEQA	California Environmental Quality Act
AICUZ	air installation compatible use zone	CERAP	(Honolulu) Center En Route Radar Approach Control
AIMD	Aircraft Intermediate Maintenance Department	CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
ALUCP	Airport Land Use Compatibility Plan	CFR	Code of Federal Regulations
amsl	above mean sea level	CLS	contractor logistics support
AOP	Activity Overview Plan	CNEL	community noise equivalent level
APCD	Air Pollution Control District	CNO	Chief of Naval Operations
APZ	accident potential zone	CO	carbon monoxide
ATC	Air Traffic Control	CONUS	Continental United States
ATSDR	Agency for Toxic Substances and Disease Registry	CPRG	Commander Patrol and Reconnaissance Group
BAMS	Broad Area Maritime Surveillance	CPRW	Commander Patrol and Reconnaissance Wing
BASH	bird-aircraft strike hazard	CRMP	Cultural Resources Management Plan
BGEPA	Bald and Golden Eagle Protection Act	CWA	Clean Water Act
bgs	below ground surface	CY	calendar year
BMPs	best management practices	CZM	coastal zone management
BRAC	Base Closure and Realignment Commission	CZMA	Coastal Zone Management Act

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dB	Decibel	FOC	full operating capability
dBA	A-weighted decibel	FRS	fleet replacement squadron
DNL	day-night average sound level	FTC	Fleet Training Center
DoD	U.S. Department of Defense	FWC	Florida Fish and Wildlife Conservation Commission
DOPAA	Description of Proposed Action and Alternatives	FY	fiscal year
DRMO	Defense Reutilization and Marketing Office	GCA	ground control approach
EA	Environmental Assessment	GMA	(Washington State) Growth Management Act
EAR	Evaluation and Appraisal Report	GSE	ground support equipment
EDMS	emissions and dispersion modeling system	HARP	Historic and Archaeological Resources Protection Plan
EFH	essential fish habitat	HLD	homeland defense
EFSEC	Energy Facility Site Evaluation Council	HVAC	heating, ventilation, and air conditioning
EIS	environmental impact statement	ICAO	International Civil Aviation Organization
EMFAC	emission factors model	ICRMP	Integrated Cultural Resources Management Program
EOD	explosive ordnance disposal	INRMP	Integrated Natural Resources Management Plan
EPA	U.S. Environmental Protection Agency	IOC	initial operating capability
ESA	Endangered Species Act	IRP	Installation Restoration Program
ESQD	explosive safety quantity distance	ISR	intelligence, surveillance, and reconnaissance
FAA	Federal Aviation Administration	ITC	Integrated Training Center
FCA	Fleet Concentration Area	JCCO	Jacksonville Complex Commanding Officer
FCLP	field carrier landing practice	JD	jurisdictional determination
FCMP	Florida Coastal Management Program	kg	kilograms
FDNF	forward deployed naval forces	L <sub>max</sub>	maximum sound level
FEMA	Federal Emergency Management Agency	LTO	landing-takeoff cycle
FNAI	Florida Natural Areas Inventory	m	meter

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MBTA	Migratory Bird Treaty Act	NHPA	National Historic Preservation Act
MCAS	Marine Corps Air Station	NM	nautical miles
MCB	Marine Corps Base	NMFS	National Marine Fisheries Service
MCBH	Marine Corps Base Hawaii	NO <sub>2</sub>	nitrogen dioxide
MFH	military family housing	NOA	Notice of Availability
MMA	Multi-Mission Maritime Aircraft	NOAA	National Oceanic and Atmospheric Administration
MMPA	Marine Mammal Protection Act	NOI	Notice of Intent
MOB	Main Operations Base	NOLF	Naval Outlying Landing Field
MOCC	Mobile Operations Control Center	NOPH	Notice of Public Hearing
MOCCRON	Mobile Operational Control Center Squadron	NPDES	National Pollutant Discharge Elimination System
MOU	Memorandum of Understanding	NPV	net present value
mph	miles per hour	NRCS	Natural Resources Conservation Service
MPR	Maritime Patrol and Reconnaissance	NRHP	National Register of Historic Places
MSA	metropolitan statistical area	NWCAA	Northwest Clean Air Agency
NAAQS	National Ambient Air Quality Standards	NWSTF	Naval Weapons Systems Training Facility
NADEP	Naval Aviation Depot	O <sub>3</sub>	ozone
NALF	Naval Auxiliary Landing Field	OLF	outlying landing field
NAM	Naval Air Base	OPNAVINST	Office of the Chief of Naval Operations Instruction
NAS	Naval Air Station	ORMA	Ocean Resource Management Act
NAVSEA	Naval Sea Systems Command	PAA	primary assigned aircraft
Navy	U.S. Department of the Navy	PACOM	U.S. Pacific Command
NCP	National Oil and Hazardous Substances Pollution Contingency Plan	Pb	Lead
NEPA	National Environmental Policy Act	PDL	proposed for delisting
NFIP	National Flood Insurance Program	PM <sub>10</sub>	particulate matter less than 10 microns in diameter



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PM <sub>2.5</sub>	particulate matter less than 2.5 microns in diameter	SVOC	semi-volatile organic compound
PMSA	primary metropolitan statistical area	SWDA	Solid Waste Disposal Act
POLS	petroleum, oils, and lubricants	SWMP	Storm Water Management Plan
POV	privately owned vehicle	SWPCP	Stormwater Pollution Control Plan
ppm	parts per million	SWPCP	Stormwater Pollution Control Plan
PRW	Patrol and Reconnaissance Wing	SWPPP	Storm Water Pollution Prevention Plan
PSD	Prevention of Significant Deterioration	TACAN	tactical air navigation
RCRA	Resource Conservation and Recovery Act	TAP	Tactical Training Theater Assessment and Planning
RIMS	regional input-output modeling system	tpy	tons per year
ROD	Record of Decision	TSC	Tactical Support Center
RSIP	Regional Shore Infrastructure Plan	U.S.C.	United States Code
SANDAG	San Diego Association of Governments	UAS	unmanned aircraft system
SDAB	San Diego Air Basin	USAF	United States Air Force
SDAPCD	San Diego Air Pollution Control District	USFWS	U.S. Fish and Wildlife Service
SEL	sound exposure level	USGS	U.S. Geological Survey
SEPA	State Environmental Policy Act	USMC	U.S. Marine Corps
SHPO	State Historic Preservation Office	USMC	United States Marine Corps
SIP	State Implementation Plan	VOC	volatile organic compound
SMA	Shoreline Management Act	VP	Patrol Squadron
SNCO	staff non-commissioned officers	WDFW	State of Washington Department of Fish and Wildlife
SO <sub>2</sub>	sulfur dioxide	WDNR	State of Washington Department of Natural Resources
SOCAL	Southern California	WGMA	Washington Growth Management Act
SSC	species of special concern	WMA	wildlife management area
SUA	special use airspace	µg/m <sup>3</sup>	micrograms per cubic meter

## **Executive Summary**

### **ES.1 Type of Report**

This Final Environmental Impact Statement (Final EIS) evaluates the potential environmental consequences of the U.S. Department of the Navy's (Navy) proposed action to provide facilities and functions to support the homebasing of 12 P-8A Multi-Mission Maritime Aircraft (MMA) squadrons and one fleet replacement squadron (FRS) (12 aircraft) at established maritime patrol homebases. This document presents the environmental consequences associated with personnel transition and new construction or renovation of structures to accommodate homebasing the P-8A MMA as the Navy phases its current maritime patrol aircraft, the P-3C Orion, out of service.

This Final EIS was prepared in accordance with the requirements of the National Environmental Policy Act (NEPA) of 1969; the Council on Environmental Quality (CEQ) regulations implementing NEPA (40 Code of Federal Regulations [CFR] 1500-1508); and Navy procedures for implementing NEPA (32 CFR 775).

### **ES.2 Description of the Proposed Action**

The proposed action is to provide facilities and functions to support the homebasing of 12 P-8A MMA fleet squadrons (72 aircraft) and one FRS (12 aircraft) at established maritime patrol homebases. The P-8A MMA would replace P-3C aircraft. The provision of facilities and functions to support the homebasing of P-8A MMA squadrons at established maritime patrol homebases would meet the need of the Navy to efficiently and economically retire P-3C aircraft and transition P-8A MMA into the fleet while maintaining a maritime patrol capability that sustains national defense objectives and policies. The homebased P-8A MMA would provide increased mission reliability while requiring a smaller force and less maintenance infrastructure. In implementing the proposed action, the Navy must ensure adequate hangar, training, maintenance, and personnel support facilities are available to meet production and delivery schedules.

Currently, P-3C patrol squadrons are based at Naval Air Station (NAS) Jacksonville, Florida; NAS Whidbey Island, Washington; NAS Brunswick, Maine; and Marine Corps Base Hawaii (MCBH) Kaneohe Bay, with periodic detachments at NAS North Island, California.

NAS Brunswick is not being considered as a potential homebase because all aircraft and supporting functions at this base are being transferred in their entirety to NAS Jacksonville as a result of the 2005 Base Closure and Realignment Commission (BRAC) recommendations. There are several variants of the P-3C aircraft in operation that will not be replaced as part of the introduction of the P-8A MMA. At NAS Jacksonville and MCBH Kaneohe Bay, VPU-1 and VPU-2 squadrons operate P-3C Update<sup>1</sup> aircraft. At NAS Whidbey Island, the VQ-1 and VQ-2 operate the EP-3 aircraft, which will continue to operate in 2020 after the P-8A MMA introduction is complete.

Hickam Air Force Base (AFB) had been considered as an alternative homebasing site in Hawaii. As such, the Navy requested that the Air Force participate in the development of this EIS as a cooperating agency. An Air Force siting study identified significant concerns regarding the viability of alternatives that included Hickam AFB. Specifically, potential P-8A MMA homebase/detachment alternatives are not operationally feasible at Hickam AFB because the ordnance handling and storage operations required under all alternatives would exceed Department of Defense (DoD) explosive safety criteria. Additionally, there is a lack of developable land necessary to support the homebasing of the P-8A MMA. A Navy study validated these concerns. Therefore, Hickam AFB was eliminated from further analysis because the site does not meet the purpose and need of the proposed action.

The P-8A MMA would replace P-3C aircraft which, for almost 50 years, have been the Naval Aviation Fleet's primary maritime patrol aircraft. Although the airframe has remained operationally viable through systematic upgrades, the P-3C aircraft is approaching the end of its service life. Extending the life of the airframe on existing P-3C aircraft has become cost-prohibitive because of metal fatigue brought on by years of high utilization rates and is the primary reason for this aircraft replacement action.

The P-8A MMA is a derivative of the Boeing 737-800 next-generation commercial aircraft and is equipped with upgraded systems capable of performing current and future maritime patrol force missions. The airframe design would provide the Navy with enhanced warfighting capabilities while achieving efficiencies in operations and support.

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<sup>1</sup> The P-3C Update and EP-3 aircraft are not part of the P-8A MMA replacement action.

Replacement of P-3C aircraft with P-8A MMA would begin no later than 2012 and be complete in 2019. The replacement process would ultimately result in an overall decrease in the number of maritime patrol aircraft and associated personnel. A total of 84 P-8A MMA squadron aircraft would replace the existing 120 P-3C squadron aircraft, resulting in a decrease of 36 maritime patrol aircraft and a decrease of approximately 1,665 personnel associated with maritime patrol aircraft squadrons.

### **Baseline Conditions**

This document describes the environmental consequences of providing facilities and functions needed to support replacement of the P-3C with the P-8A MMA, the Navy's proposed action. To compare probable/possible effects of the proposed action, baseline environmental conditions must first be defined. The year 2011 has been chosen as the baseline year to provide a comparison for the environmental analyses presented in this document. The year 2011 is defined as the baseline year for the affected environment because it is the year prior to the introduction of the P-8A MMA. The analysis takes into account the changes in aircraft and personnel scheduled to occur before the P-8A MMA is introduced the following year, 2012.

Several changes in aircraft and personnel loading are scheduled to occur at existing P-3C homebases before or concurrent with the introduction of the P-8A MMA. These changes include:

- Retiring S-3 operational squadrons at NAS Jacksonville;
- Transferring aircraft to NAS Jacksonville from NAS Brunswick per the 2005 BRAC report; and
- Replacing EA-6B aircraft with EA-18G aircraft at NAS Whidbey Island.

Each of these actions has been considered and incorporated into the baseline conditions specifically related to noise, personnel loading, payroll expenditures, facilities, and infrastructure.

### **ES.3 Homebasing Alternatives Development**

In general, functions and facilities needed to support the P-8A MMA are similar to existing facilities and functions supporting P-3C aircraft. The Navy considered six replacement alternatives and a "no action" alternative. The alternatives were developed as follows:

- **Alternative 1.** Status quo for P-3C basing. Homebase six fleet squadrons with an FRS at NAS Jacksonville, three fleet squadrons at NAS Whidbey Island with periodic squadron detachment operations at NAS North Island, and three fleet squadrons at MCBH Kaneohe Bay.
- **Alternative 2.** Homebase five fleet squadrons with an FRS at NAS Jacksonville, seven fleet squadrons at NAS Whidbey Island with periodic squadron detachment operations at NAS North Island, and a permanent squadron detachment at MCBH Kaneohe Bay.
- **Alternative 3.** Homebase five fleet squadrons with an FRS at NAS Jacksonville, five fleet squadrons at NAS Whidbey Island with periodic squadron detachment operations at NAS North Island, and two fleet squadrons at MCBH Kaneohe Bay.
- **Alternative 4.** Homebase five fleet squadrons at NAS Jacksonville, five fleet squadrons with an FRS at NAS Whidbey Island with periodic squadron detachment operations at NAS North Island, and two fleet squadrons at MCBH Kaneohe Bay.
- **Alternative 5 (Preferred Alternative).** Homebase five fleet squadrons with an FRS at NAS Jacksonville, four fleet squadrons at NAS Whidbey Island with periodic squadron detachment operations at NAS North Island, and three fleet squadrons at MCBH Kaneohe Bay.
- **Alternative 6.** Homebase five fleet squadrons at NAS Jacksonville, four fleet squadrons with an FRS at NAS Whidbey Island with periodic squadron detachment operations at NAS North Island, and three fleet squadrons at MCBH Kaneohe Bay.
- **No Action Alternative.** Under the No Action Alternative no new or expanded facilities would be constructed, and there would be no increase in functional capacity at any alternative homebasing site. The No Action Alternative does not meet the purpose and need of the proposed action. However, the No Action alternative serves as a baseline for describing and quantifying the impacts associated with the various basing alternatives described in detail. It provides a benchmark, using P-3C flight operations to compare with the necessary aircraft operations, personnel transition, and new construction or renovation of structures to accommodate the P-8A MMA.

## **ES.4 Preferred Alternative**

The Navy identified Alternative 5 as the preferred alternative. Alternative 5 would homebase five P-8A MMA fleet squadrons and the FRS at NAS Jacksonville, four fleet squadrons at NAS Whidbey Island, and three fleet squadrons at MCBH Kaneohe Bay, with periodic squadron detachments at NAS North Island. Alternative 5 best meets mission requirements while optimizing operational efficiencies related to training and contractor logistics support functions.

## **ES.5 Assessment of Required Homebasing Facility Components**

Specific operational support facility criteria unique to homebasing P-8A MMA squadrons were also developed. Facility components necessary to accommodate the P-8A MMA for each siting alternative, including facilities for aircraft operations, training, maintenance, supply, and personnel support, bachelor and family housing, and utilities are described below.

Support facilities available at each alternative receiving site were assessed in terms of existing use, condition, and capacity to determine whether new construction or renovation was needed. Adequacy, deficiency, or excesses of each facility were assessed using guidelines found in *Facility Planning Criteria for Navy and Marine Corps Shore Installations, Naval Facilities Engineering Command (NAVFAC) P-80*. New construction and renovation that would be required at each alternative receiving site is summarized as follows:

- **NAS Jacksonville.** The proposed action bases P-8A MMA at NAS Jacksonville under all alternatives, basing 30 to 48 aircraft at the installation, inclusive of placement of the FRS (Alternatives 1, 2, 3, and 5). To accommodate these aircraft, the Navy would need to build training facilities and an associated parking area for privately owned vehicles. A six-bay Type II, modified hangar currently under construction to support the BRAC P-3C move from NAS Brunswick would be adequate to serve P-8A MMA squadrons under each basing alternative at NAS Jacksonville.
- **NAS Whidbey Island.** The proposed action bases P-8A MMA at NAS Whidbey Island under all alternatives, basing anywhere from 18 to 42 aircraft at the installation, including placement of an FRS (Alternatives 4 and 6). To accommodate these aircraft, primary facilities that would have to be constructed (depending on the alternative constructed) include a new aircraft hangar (two-, three-, four-, five- or six-bay Type II, modified, depending on the number of aircraft allocated), an aircraft parking apron and ramp space, an operational storage facility, and an ordnance storage building. The majority of construction would occur in the southeast portion of the flight-line. Construction at NAS Whidbey Island would require demolition and/or replacement of limited existing structures and facilities.
- **MCBH Kaneohe Bay.** The proposed action would site P-8A MMA at MCBH Kaneohe Bay under all alternatives, basing anywhere from 12 to 18 P-8A MMA at the installation under Alternatives 1, 3, 4, 5, or 6. Alternative 2 would site a permanent squadron detachment, i.e., two aircraft. Under Alternatives 1 through 6, excluding Alternative 2, a new Type II, modified hangar would be constructed south of the main runway. No hangar would be constructed under Alternative 2. Existing aircraft parking apron space is sufficient to support the P-8A MMA under all alternatives. A parking area for personal vehicles would be constructed next to the hangar under all alternatives, except Alternative 2. Alternatives 1 through 6, excluding Alternative 2, would require minor renovations and a fair amount of facility demolition.

- **NAS North Island.** The proposed action sites P-8A MMA at NAS North Island under each alternative through periodic squadron detachments of aircraft at the installation, with anywhere from two to six aircraft detaching to the installation for temporary training missions. No construction, renovation, or demolition would be required to accommodate these aircraft. NAS North Island has adequate facilities in place to support training detachments under the P-8A MMA program because they have been supporting identical training detachments under the P-3C program. There would be no change in the training routines or activities.

## **ES.6 Public Involvement**

### **Scoping**

The Navy conducted a scoping period (December 2006 to March 2007) for the proposed action. Scoping was conducted following the Navy's Notice of Intent (NOI) in December 2006 to prepare an EIS for introduction of the P-8A MMA to the U.S. Navy Fleet. The Navy held four public scoping meetings, attended by 86 persons. Agencies, organizations, and concerned citizens provided comments on the Navy's proposed action. A total of 29 comments were received.

No significant impacts or areas of controversy were identified through the scoping process, although concerns raised during the scoping period included the following:

- **Alternatives.** Commenters expressed support or opposition for alternative home-basing sites; some suggested alternative locations both in the continental United States and in the Pacific.
- **Operations.** Information was requested on operations, operational costs, flight patterns, take-off and approach profiles, and holding patterns and how they could change under the proposed action.
- **Weaponry.** Information was requested regarding types of weapons carried by the P-8A MMA and possible dangers to the public.
- **Safety.** Commenters asked about the safety of landing patterns.
- **Noise Impact.** Some commenters thought the proposed action would reduce noise and others were concerned about increased noise.
- **Coastal Consistency.** Commenters requested the proposed action be consistent with state Coastal Zone Management Plans.
- **Air Quality.** Potential health and environmental effects associated with an increase in air emissions were noted.
- **Socioeconomics.** Commenters requested further information on how the proposed action could influence housing markets, traffic loads, and local community schools.
- **Community Services.** Commenters asked about impacts on community services.

- **Traffic.** Commenters were concerned about overcrowding local roads.
- **Vegetation and Wildlife.** Commenters expressed concern about negative impacts on marine ecosystems and requested that the EIS present subsequent findings.
- **Water Quality and Use.** Water quality impacts from storm water and wastewater run-off and impacts on availability of potable water that might arise from increases in support personnel were a concern of some commenters.
- **Lights.** Comments about impacts on the natural nighttime sky and the lighting environment were made.
- **Cultural Resources.** The impact of the proposed action on cultural resources was a concern.
- **Environmental Hazards.** Commenters requested information about the effects of the proposed action with respect to potential tsunamis and hurricane storm surges in areas of low elevation.
- **Hazardous Materials.** Some questions were noted about impacts associated with fuel spills; information on P-8A MMA fuel storage systems and a spill-containment procedure was requested.

### **The Public Hearing Process**

Following the Navy's publication of the Notice of Availability (NOA) in March 2008, which signaled the release and availability of the draft EIS for the introduction of the P-8A MMA to the U.S. Navy Fleet, the Navy held a public comment period from March 2008 to April 2008 on the proposed action. The Navy held four public hearings, which were attended by 60 people. Transcripts of the proceedings at each public hearing are provided in Appendix C. Agencies, organizations, and concerned citizens provided comments on the Navy's proposed action. A total of 94 comments were received.

No significant impacts or areas of controversy were identified through the public hearing process, although concerns raised during the public comment period include the following:

- **Alternatives.** Commenters expressed support or opposition for alternative homebasing sites; some suggested alternative locations both in the continental United States and in the Pacific.
- **Public Involvement.** Concerns were raised regarding the public notification process and the availability of the draft EIS for public review.
- **Air Operations.** Commenters expressed concerns about aircraft operating outside standard flight tracks and over residential areas.
- **Personnel Numbers.** Commenters raised questions about personnel numbers and personnel increases or decreases at the homebasing sites.



- **Weaponry.** Information was requested regarding types of weapons carried by the P-8A MMA and stored at the homebasing sites and possible dangers to the public.
- **Safety.** Commenters expressed concerns regarding the risk of plane crashes and other emergencies.
- **Noise Impacts.** Commenters raised issues regarding the methodology used in the draft EIS to measure noise and expressed concerns that noise would increase with the introduction of P-8A MMA aircraft.
- **Air Quality.** Concerns were raised about local air quality.
- **Socioeconomics.** Commenters suggested that the Final EIS analyze potential impacts on property values as a result of an increase in noise and potential impacts resulting from the P-8A MMA not being introduced at the homebasing sites.
- **Traffic.** Commenters were concerned that traffic would increase on local roads.
- **Water Quality.** Commenters noted studies on storm water runoff were not included in the draft EIS and would have to be completed.
- **Biological Resources.** Commenters expressed concerns regarding endangered species consultations and invasive species.
- **Cultural Resources.** Concerns were raised about impacts on cultural resources due to construction.
- **Cumulative Impacts.** Concerns were raised regarding the scope of the cumulative impacts analysis.
- **General.** Comments in support of the proposed action were provided as well as comments in regard to addressing scoping comments in the draft EIS, the extent of data-gathering during the scoping process, use of technical language in the draft document, omission of the noise report in paper copies of the draft EIS, and assignment of levels of significance to impacts identified in the document. Additionally, some commenters requested copies of the transcripts generated at the public hearings.

### **Changes to the Draft EIS**

After the release of the draft EIS, updates to technical data and studies were incorporated into this Final EIS. Changes included corrections to the baseline annual air operations for P-3C aircraft, the distinction between P-3C and EP-3 aircraft operations at NAS Whidbey Island and between P-3C and P-3C Update aircraft at NAS Jacksonville and MCBH Kaneohe Bay, and revisions to the proposed P-8A MMA facilities siting footprint at MCBH Kaneohe Bay. These corrections resulted in changes in the discussion on air operations, noise, and land use for NAS Whidbey Island, NAS Jacksonville, and MCBH Kaneohe Bay. Other changes included revisions to the proposed construction footprints at NAS Whidbey Island to minimize impacts on wetlands

and to accommodate operational requirements and the identification and evaluation of mitigative measures to address wetland impacts. These revisions led to changes in the analysis of natural resources on NAS Whidbey Island. An expanded noise analysis, including specific sound-exposure level (SEL) modeling at each installation, was conducted to address concerns raised during the public hearing process. Additional changes involved incorporating responses to draft EIS public hearing comments and finalized consultations with regulatory agencies.

## **ES.7 Summary of Environmental Effects**

### **ES.7.1 Alternative 1**

#### **NAS Jacksonville**

Alternative 1 would homebase six fleet squadrons and the FRS at NAS Jacksonville. Potential environmental impacts from this proposed action would include the following: The number of airfield operations, when compared with baseline conditions, would decrease by 13%. The land area and population within the greater-than-65 decibel (dB) day-night average sound level (DNL) noise zones would increase (108% and 175% respectively) in comparison with NAS Jacksonville's baseline conditions. Residential land located within the projected greater-than-65 dB DNL noise zones would increase by 59 acres. Regional air quality would not be affected: short-term, temporary construction emissions and projected annual operating emissions would be below the minimum federal threshold of 250 tons per year (tpy) for all criteria pollutants. The community surrounding NAS Jacksonville would experience a slight decrease in population, down 0.6% from baseline conditions, and a decrease in total school district enrollment, down less than 1% from baseline conditions. Regional annual earnings would decrease by \$250.8 million. Facility construction would generate \$53.3 million in one-time construction expenditures, with an overall economic impact of \$167.8 million on the regional economy. There would be no potential for disproportionally high and adverse environmental and human health impacts on low-income populations; however, there would be a potential impact on minority populations and children. Topography would not change and there would be no significant filling or grading. With proper mitigation as specified in the installation's Storm Water Pollution Prevention Plan there would be a negligible impact on water quality and no impacts on floodplains or groundwater. Construction of new facilities at NAS Jacksonville also would result in a permanent loss of

vegetation—approximately 4 acres of maintained lawn and potentially less than 1 acre of pine stand. No impacts on wetlands or threatened and endangered species, negligible impacts on wildlife, and no takes of marine mammals are anticipated. There would be no effect on architectural or archaeological resources. No additional hazardous materials and/or waste streams would be generated that cannot be managed by existing functions and facilities.

### **NAS Whidbey Island**

Alternative 1 would homebase three fleet squadrons at NAS Whidbey Island. Potential environmental impacts from this proposed action would include the following: The number of airfield operations, when compared with baseline conditions, would decrease by 7%. The land area within the greater-than-65 dB DNL noise zones would decrease slightly (less than 1%) compared with baseline conditions; and there would be no additional incompatible land uses within the greater-than-65 dB DNL noise zones. The population exposed to the greater-than-65 dB DNL noise zones would increase (by 597 people); however, this increase is virtually identical to the projected 7% population growth of Island County between 2013 and 2019. Regional air quality would not be affected: short-term, temporary construction emissions and projected annual operating emissions would be below the minimum federal threshold of 250 tpy for all criteria pollutants. The community surrounding NAS Whidbey Island would experience a decrease in the region's population, down 2.2% from baseline conditions, and a 4.3% decrease in total school district enrollment, compared with baseline conditions. Regional annual earnings would decrease by \$78.3 million. Facility construction would generate \$108.5 million in one-time construction expenditures, with an overall economic impact of \$342.7 million on the regional economy. There would be no change from the baseline conditions in the potential for disproportionately high and adverse impacts on minority and low-income populations and no potential environmental health and safety risks for children. The installation's topography at the primary construction area would be altered slightly by increasing surface elevation an estimated 1 to 2 feet. Approximately 0.2 acres of wetlands would be filled and mitigated in accordance with the required regulations of the State of Washington Department of Ecology and the U.S. Army Corps of Engineers (USACE). With proper mitigation as specified in the installation's Stormwater Management Plan there would be no impacts on surface water or groundwater; however, there would be a minor impact on water quality, but only during construction. Construction of new

facilities would also result in a permanent loss of approximately 5.6 acres of herbaceous vegetation. Negligible impacts on wildlife and no takes of marine mammals are anticipated. Implementation of Alternative 1 would have the following impacts on threatened and endangered species: no effect on the humpback whale, southern resident killer whale, Steller sea lion, and leatherback sea turtle; may affect but is not likely to adversely affect the marbled murrelet, Puget Sound chinook salmon, Puget Sound steelhead, and bull trout or their respective designated critical habitat. A Phase 1 archaeological survey has been conducted. The Navy continues to consult with Washington's State Historic Preservation Office (SHPO) on mitigation efforts for any potentially adverse effects. No additional hazardous materials and/or waste streams would be generated that cannot be managed by existing functions and facilities.

### **MCBH Kaneohe Bay**

Alternative 1 would homebase three fleet squadrons at MCBH Kaneohe Bay. Potential environmental impacts from this proposed action would include the following: The number of airfield operations, when compared with baseline conditions, would decrease by 10%. The land area within the greater-than-65 dB DNL noise zones would increase (5%) in comparison with baseline conditions. There would be no change in civilian population and no additional incompatible land uses within the greater-than-65 dB DNL noise zones. Regional air quality would not be affected: short-term, temporary construction emissions and projected annual operating emissions would be below the minimum federal threshold of 250 tpy for all criteria pollutants; projected annual operating emissions of all criteria pollutants would decrease. The community surrounding MCBH Kaneohe Bay would experience a slight decrease in the region's population, down 0.2% from baseline conditions, and a decrease in total school district enrollment, down 6.8% from baseline conditions. Regional annual earnings would decrease by \$93.5 million. Facility construction would generate \$147.5 million in one-time construction expenditures, with an overall economic impact of \$445.8 million on the regional economy. There would be no change from the baseline condition in the potential for disproportionately high and adverse impacts on minority and low income populations and no potential environmental health or safety risks for children. There would be no change to topography and no significant filling or grading, negligible impacts on water quality, no impact on floodplains or groundwater with proper mitigation as specified in the installation's Stormwater Management Plan, and no impacts on wetlands. Con-

struction would result in a permanent loss of vegetation—up to 4 acres of Bermuda grass. Minor impacts on vegetation, negligible impacts on wildlife, and no takes of marine mammals are anticipated. Implementation of Alternative 1 may affect but is not likely to adversely affect the following threatened and endangered species: the Hawaiian monk seal, humpback whale, sperm whale, Newell's shearwater, green sea turtle, and hawksbill sea turtle. There would be no effect on the Hawaiian hoary bat, Hawaiian stilt, Hawaiian common moorhen, Hawaiian coot, Hawaiian duck, round-leaved chaff-flower, Puukaa, white hibiscus, yellow hibiscus, Loulu palm, and Ohai threatened and endangered species. Consultation under Section 106 of the National Historic Preservation Act (NHPA) for architectural and archaeological resources was initiated in a letter dated August 30, 2007. The Navy sent a follow-up letter on September 11, 2008 including a determination that the proposed construction will not result in any adverse effects on historic properties. The Navy will continue to consult with the Hawaii SHPO and, based on any findings from the archaeological testing, will work with the Hawaii SHPO to mitigate any potential effects. No additional hazardous materials and/or waste streams would be generated that cannot be managed by existing functions and facilities.

### **NAS North Island**

Alternative 1 would site periodic squadron detachments at NAS North Island. Potential environmental impacts from this proposed action would include the following: The number of airfield operations, when compared with baseline conditions, would decrease by less than 1%. The land area and population within the greater-than-65 dB DNL noise zones would decrease slightly (1% and 2% respectively) in comparison with baseline conditions. There would be no additional incompatible land uses within the greater-than-65 dB DNL noise zones. There would be no change from the baseline conditions in the potential for disproportionately high and adverse impacts on minority and low-income populations and environmental health and safety risks for children. There would be no construction emissions or impact on regional air quality; no change in the regional population or total school district enrollment; no significant impact on the regional economy; no impact on soils or topography; no impact on floodplains, water quality, or groundwater; no impact on wetlands, vegetation, or wildlife, and no anticipated takes of marine mammals; no effect on threatened and endangered species; no effect on architectural or archaeological resources; and no impacts on hazardous materials generation.

## **ES.7.2 Alternative 2**

### **NAS Jacksonville**

Alternative 2 would homebase five fleet squadrons and an FRS at NAS Jacksonville. Potential environmental impacts from this proposed action would include the following: The number of airfield operations, when compared with baseline conditions, would decrease by 21%. The land area and population within the greater-than-65 dB DNL noise zones would increase (85% and 111% respectively) in comparison with baseline conditions. Residential land located within the projected greater-than-65 dB DNL noise zones would increase by 41 acres. Regional air quality would not be affected: short-term, temporary construction emissions and projected annual operating emissions would be below the minimum federal threshold of 250 tpy for all criteria pollutants. The community surrounding NAS Jacksonville would experience a slight decrease in the region's population, down 0.7% from baseline conditions, and a decrease in total school district enrollment, down less than 1% from baseline conditions. Regional annual earnings would decrease by \$285.9 million. Facility construction would generate \$53.3 million in one-time construction expenditures, with an overall economic impact of \$167.8 million on the regional economy. There would be no potential for disproportionately high and adverse environmental and human health impacts on low-income populations; however, there would be a potential impact on minority populations and children. There would be no change to topography and no significant filling or grading, negligible impacts on water quality, and no impacts on floodplains or groundwater with proper mitigation as specified in the installation's Storm Water Pollution Prevention Plan. Construction of new facilities would result in a permanent loss of vegetation—approximately 4 acres of maintained lawn and potentially less than 1 acre of pine stand. No impacts on wetlands, no effects on threatened and endangered species, no adverse effects on wildlife, and no takes of marine mammals are anticipated. There would be no effect on architectural or archaeological resources, and no additional hazardous materials and/or waste streams would be generated that cannot be managed by existing functions and facilities.

### **NAS Whidbey Island**

Alternative 2 would homebase seven fleet squadrons at NAS Whidbey Island. Potential environmental impacts from this proposed action would include the following: The number of

airfield operations, when compared with baseline conditions, would increase by 30%. The land area within the greater-than-65 dB DNL noise zones would increase slightly (less than 1%) compared with baseline conditions; there would be no additional incompatible land uses within the greater-than-65 dB DNL noise zones. The population exposed to the greater-than-65 dB DNL noise zones would increase (by 619 people); however, this increase is virtually identical to the projected population growth of Island County of 7% between 2013 and 2019. Regional air quality would not be affected: short-term temporary construction emissions and projected annual operating emissions would be below the minimum federal threshold of 250 tpy for all criteria pollutants. The community surrounding NAS Whidbey Island would experience an increase in the region's population, up 1.6% from baseline conditions, and an increase in total school district enrollment, up 4.4% from baseline conditions. Regional annual earnings would increase by \$90.4 million. Facility construction would generate \$243.1 million in one-time construction expenditures, with an overall economic impact of \$768.1 million on the regional economy. There would be no change from the baseline conditions in the potential for disproportionately high and adverse impacts on minority and low-income populations and no change in environmental health and safety risks for children. The installation's topography would be slightly altered at the primary construction area by increasing surface elevation an estimated 1 to 2 feet. Approximately 6.8 acres of wetlands would be filled and mitigated in accordance with the required regulations of the State of Washington Department of Ecology and the USACE. With proper mitigation as specified in the installation's Stormwater Management Plan there would be no impacts on surface water or groundwater and minor impacts on water quality, but only during construction. Construction of new facilities would result in a permanent loss of approximately 32.6 acres of herbaceous vegetation. Negligible impacts on wildlife and no takes of marine mammals are anticipated. Implementation of Alternative 2 would have the following impacts on threatened and endangered species: no effect on the humpback whale, southern resident killer whale, Steller sea lion, and leatherback sea turtle; may affect but is not likely to adversely affect the marbled murrelet, Puget Sound Chinook salmon, Puget Sound steelhead, and bull trout or their respective designated critical habitat. A Phase 1 archaeological survey has been conducted. The Navy continues to consult with the Washington SHPO on mitigation efforts for any potentially adverse

effects. No additional hazardous materials and/or waste streams would be generated that cannot be managed by existing functions and facilities.

### **MCBH Kaneohe Bay**

Alternative 2 would site a permanent squadron detachment at MCBH Kaneohe Bay. Potential environmental impacts from this proposed action would include the following: The number of airfield operations, when compared with baseline conditions, would decrease by 40%. There would be no increase in the land area within the greater-than-65 dB DNL noise zones in comparison with baseline conditions. There would be no change in civilian populations and no additional incompatible land uses within the greater-than-65 dB DNL noise zones. Regional air quality would not be affected: short-term, temporary construction emissions and projected annual operating emissions would be below the minimum federal threshold of 250 tpy for all criteria pollutants; projected annual operating emissions for all criteria pollutants would decrease. The community surrounding MCBH Kaneohe Bay would experience a slight decrease in the region's population, down 0.5% from baseline conditions, and a decrease in total school district enrollment, down 17.3% from baseline conditions. Regional annual earnings would decrease by \$239.6 million. Facility construction would generate \$4.9 million in one-time construction expenditures, with an overall economic impact of \$14.9 million on the regional economy. There would be no change from the baseline conditions in the potential for disproportionately high and adverse impacts on minority and low-income populations and no potential environmental health and safety risks for children. There would be no change to topography and no significant filling or grading, negligible impacts on water quality, no impacts on floodplains or groundwater with proper mitigation as specified in the installation's Stormwater Management Plan, and no impacts on wetlands. No impacts on vegetation, negligible impacts on wildlife, and no takes of marine mammals are anticipated. Implementation of Alternative 2 may affect but is not likely to adversely affect the following threatened and endangered species: Hawaiian monk seal, humpback whale, sperm whale, Newell's shearwater, green sea turtle, and hawksbill sea turtle. There would be no effect on the Hawaiian hoary bat, Hawaiian stilt, Hawaiian common moorhen, Hawaiian coot, Hawaiian duck, round-leaved chaff-flower, Puukaa, white hibiscus, yellow hibiscus, Loulu palm, and Ohai threatened and endangered species. Consultation under Section 106 of the National Historic Preservation Act (NHPA) for architectural and archaeological resources was



initiated in a letter dated August 30, 2007. The Navy sent a follow-up letter on September 11, 2008 including a determination that the proposed construction will not result in any adverse effects on historic properties. The Navy will continue to consult with the Hawaii SHPO and, based on any findings from the archaeological testing, will work with the Hawaii SHPO to mitigate any potential effects. No additional hazardous materials and/or waste streams would be generated that cannot be managed by existing functions and facilities.

### **NAS North Island**

Alternative 2 would site periodic squadron detachments at NAS North Island. Potential environmental impacts from this proposed action would include the following: The number of airfield operations, when compared with baseline conditions, would decrease by less than 1%. The land area and population within the greater-than-65 dB DNL noise zones would decrease slightly (1% and 2% respectively) in comparison with baseline conditions at NAS North Island. There would be no change from baseline conditions in the potential for disproportionately high and adverse impacts on minority and low-income populations and environmental health and safety risks for children. There would be no additional incompatible land uses within the greater-than-65 dB DNL noise zones; no construction emissions or impacts on regional air quality; no change in regional population or total school district enrollment; no significant impact on the regional economy; no impact on topography or soils, floodplains, water quality, groundwater, wetlands, vegetation, or wildlife; no anticipated takes of marine mammals; no effect on threatened and endangered species, no effect on architectural or archaeological resources; and no impact on hazardous materials generation.

### **ES.7.3 Alternative 3**

#### **NAS Jacksonville**

Alternative 3 would homebase five fleet squadrons and the FRS at NAS Jacksonville. Potential environmental impacts from this proposed action would include the following: The number of airfield operations, when compared with baseline conditions, would decrease by 21%. The land area and population within the greater-than-65 dB DNL noise zones would increase (85% and 111% respectively) in comparison with baseline conditions at NAS Jacksonville. Residential land located within the projected greater-than-65 dB DNL noise zones would in-

crease by 41 acres. Regional air quality would not be affected: short-term, temporary construction emissions and projected annual operating emissions would be below the minimum federal threshold of 250 tpy for all criteria pollutants. The community surrounding NAS Jacksonville would experience a slight decrease in the region's population, down 0.7% from baseline conditions, and a decrease in total school district enrollment, down less than 1% from baseline conditions. Regional annual earnings would decrease by \$285.9 million. Facility construction would generate \$53.3 million in one-time construction expenditures, with an overall economic impact of \$167.8 million on the regional economy. There would be no potential for disproportionately high and adverse environmental and human health impacts on low-income populations; however, there would be a potential impact on minority populations and children. There would be no change to topography and no significant filling or grading. With proper mitigation as specified in the installation's Storm Water Pollution Prevention Plan, there would be a negligible impact on water quality and no impacts on floodplains or groundwater. Construction of new facilities at NAS Jacksonville would result in a permanent loss of vegetation—approximately 4 acres of maintained lawn and potentially less than 1 acre of pine stand. There would be no impact on wetlands, no effect on threatened and endangered species, no adverse effect on wildlife, and no anticipated takes of marine mammals. There would be no effect on architectural or archaeological resources, and no additional hazardous materials and/or waste streams would be generated that cannot be managed by existing functions and facilities.

### **NAS Whidbey Island**

Alternative 3 would homebase five fleet squadrons at NAS Whidbey Island. Potential environmental impacts from this proposed action would include the following: The number of airfield operations, when compared with baseline conditions, would decrease by 8%. The land area within the greater-than-65 dB DNL noise zones would increase slightly (less than 1%) compared with baseline conditions; there would be no additional incompatible land uses within the greater-than-65 dB DNL noise zones. The population exposed to the greater-than-65 dB DNL noise zones would increase (by 610 people); however, this increase is virtually identical to the projected 7% population growth of Island County between 2013 and 2019. Regional air quality would not be affected: temporary construction emissions and projected annual operating emissions would be below the minimum federal threshold of 250 tpy for all criteria pollutants. The

community surrounding NAS Whidbey Island would experience a less than 0.1% decrease in regional population from baseline conditions; however, there would be a slight increase in total school district enrollment, up 0.8% from baseline conditions. Regional annual earnings would increase by \$20.6 million. Facility construction would generate \$177.9 million in one-time construction expenditures, with an overall economic impact of \$562.2 million on the regional economy. There would be no change from the baseline conditions in the potential for disproportionately high and adverse impacts on minority and low-income populations and no change in environmental health and safety risks for children. The installation's topography would be slightly altered at the primary construction area by increasing surface elevation an estimated 1 to 2 feet. Approximately 2.5 acres of wetlands would be filled and mitigated in accordance with the required regulations of the State of Washington Department of Ecology and the USACE. With proper mitigation as specified in the installation's Stormwater Management Plan there would be no impacts on surface water or groundwater and minor impacts on water quality, but only during construction. Construction of new facilities would result in a permanent loss of approximately 11.8 acres of herbaceous vegetation. Negligible impacts on wildlife and no takes of marine mammals are anticipated. Implementation of Alternative 3 would have the following impacts on threatened and endangered species: no effect on the humpback whale, southern resident killer whale, Steller sea lion, and leatherback sea turtle; may affect but is not likely to adversely affect the marbled murrelet, Puget Sound chinook salmon, Puget Sound steelhead, and bull trout or their respective designated critical habitat. A Phase 1 archaeological survey has been conducted. The Navy continues to consult with the Washington SHPO on mitigation efforts for any potentially adverse effects. No additional hazardous materials and/or waste streams would be generated that cannot be managed by existing functions and facilities.

### **MCBH Kaneohe Bay**

Alternative 3 would homebase two fleet squadrons at MCBH Kaneohe Bay. Potential environmental impacts from this proposed action would include the following: The number of airfield operations, when compared with baseline conditions, would decrease by 16%. The land area within the greater-than-65 dB DNL noise zones would decrease (5%) in comparison with baseline conditions at MCBH Kaneohe Bay. There would be no change in civilian population and no additional incompatible land uses within the greater-than-65 dB DNL noise zones. Re-

gional air quality would not be affected: short-term, temporary construction emissions and projected annual operating emissions would be below the minimum federal threshold of 250 tpy for all criteria pollutants; projected annual operating emissions for all criteria pollutants would decrease. The community surrounding MCBH Kaneohe Bay would experience a slight decrease in the region's population, down 0.3% from baseline conditions, and a decrease in total school district enrollment, down 10.1% from baseline conditions. Regional annual earnings would decrease by \$138.7 million. Facility construction would generate \$136.4 million in one-time construction expenditures, with an overall economic impact of \$412.4 million on the regional economy. There would be no change from the baseline conditions in the potential for disproportionately high and adverse impacts on minority and low-income populations and no potential environmental health and safety risks for children. There would be no change to topography and no significant filling or grading, negligible impacts on water quality, no impact on floodplains or groundwater with proper mitigation as specified in the installation's Stormwater Management Plan, and no impact on wetlands. Construction of new facilities would result in a permanent loss of vegetation—up to 4 acres of Bermuda grass. Minor impacts on vegetation, negligible impacts on wildlife, and no takes of marine mammals are anticipated. Implementation of Alternative 3 may affect but is not likely to adversely affect the following threatened and endangered species: the Hawaiian monk seal, humpback whale, sperm whale, Newell's shearwater, green sea turtle, and hawksbill sea turtle. There would be no effect on the Hawaiian hoary bat, Hawaiian stilt, Hawaiian common moorhen, Hawaiian coot, Hawaiian duck, round-leaved chaff-flower, Puukaa, white hibiscus, yellow hibiscus, Loulu palm, and Ohai threatened and endangered species. Consultation under Section 106 of the National Historic Preservation Act (NHPA) for architectural and archaeological resources was initiated in a letter dated August 30, 2007. The Navy sent a follow-up letter on September 11, 2008 including a determination that the proposed construction will not result in any adverse effects on historic properties. The Navy will continue to consult with the Hawaii SHPO and, based on any findings from the archaeological testing, will work with the Hawaii SHPO to mitigate any potential effects. No additional hazardous materials and/or waste streams would be generated that cannot be managed by existing functions and facilities.

## **NAS North Island**

Alternative 3 would site periodic squadron detachments at NAS North Island. Potential environmental impacts from this proposed action would include the following: The number of airfield operations, when compared with baseline conditions, would decrease by less than 1%. The land area and population within the greater-than-65 dB DNL noise zones would decrease slightly (1% and 2% respectively) when compared with baseline conditions. There would be no change from baseline conditions in the potential for disproportionately high and adverse impacts on minority populations, low income populations, and environmental health and safety risks for children. There would be no incompatible land uses within the greater-than-65 dB DNL noise zones; no construction emissions or impacts on regional air quality; no change in the regional population or total school district enrollment; no significant impacts on the regional economy; no impact on topography or soils, floodplains, water quality, groundwater, wetlands, vegetation, or wildlife; no anticipated takes of marine mammals; no effects on threatened and endangered species; no effects on architectural or archaeological resources; and no impacts on hazardous materials generation.

### **ES.7.4 Alternative 4**

## **NAS Jacksonville**

Alternative 4 would homebase five fleet squadrons at NAS Jacksonville. Potential environmental impacts from this proposed action would include the following: The number of airfield operations, when compared with baseline conditions, would decrease by 39%. The land area and population within the greater-than-65 dB DNL noise zones would increase slightly (26% and 37%, respectively) in comparison with NAS Jacksonville's baseline conditions. Residential land located within the projected greater-than-65 dB DNL noise zones would increase by 9 acres. Regional air quality would not be affected: short-term, temporary construction emissions and projected annual operating emissions would be below the minimum federal threshold of 250 tpy for all criteria pollutants. The community surrounding NAS Jacksonville would experience a slight decrease in the region's population, down 0.8% from baseline conditions, and a decrease in total school district enrollment, down less than 1% from baseline conditions. Regional annual earnings would decrease by \$328.4 million. Facility construction would generate

\$36.7 million in one-time construction expenditures, with an overall economic impact of \$115.4 million on the regional economy. There would be no potential for disproportionately high and adverse environmental and human health impacts on low-income populations; however, there would be a potential impact on minority populations and children. There would be no change to topography and no significant filling or grading, a negligible impact on water quality, and no impact on floodplains or groundwater with proper mitigation as specified in the installation's Storm Water Pollution Prevention Plan. Construction of new facilities would result in a permanent loss of vegetation—approximately 2 acres of maintained lawn. No impacts on wetlands, no effects on threatened and endangered species, no adverse effect on wildlife, and no takes of marine mammals are anticipated. There would be no effect on architectural or archaeological resources and no additional hazardous materials and/or waste streams would be generated that cannot be managed by existing functions and facilities.

### **NAS Whidbey Island**

Alternative 4 would homebase five fleet squadrons and an FRS at NAS Whidbey Island. Potential environmental impacts from this proposed action would include the following: The number of airfield operations, when compared with baseline conditions, would increase by 31%. The land area within the greater-than-65 dB DNL noise zones would increase slightly (less than 1%) from NAS Whidbey Island's baseline conditions; there would be no additional incompatible land uses within the greater-than-65 dB DNL noise zones. The population exposed to the greater-than-65 dB DNL noise zones would increase (by 621 people); however, this increase is virtually identical to the projected 7% population growth of Island County between 2013 and 2019. Regional air quality would not be affected: short-term, temporary construction emissions and projected annual operating emissions would be below the minimum federal threshold of 250 tpy for all criteria pollutants. The community surrounding NAS Whidbey Island would experience an increase in the region's population, up 1.2% from baseline conditions, with an increase in total school district enrollment, up 3.5% from baseline conditions. Regional annual earnings would increase by \$63.2 million. Facility construction would generate \$258.8 million in one-time construction expenditures, with an overall economic impact of \$817.6 million on the regional economy. There would be no change from the baseline conditions in the potential for disproportionately high and adverse impacts on minority and low-income populations and no

change in environmental health and safety risks for children. The installation's topography at the primary construction area would be slightly altered by increasing surface elevation an estimated 1 to 2 feet. Approximately 6.7 acres of wetlands would be filled and mitigated in accordance with the required regulations of the State of Washington Department of Ecology and the USACE. With proper mitigation as specified in the installation's Stormwater Management Plan there would be no impacts on surface water or groundwater and minor impacts on water quality, but only during construction. Construction of new facilities would result in a permanent loss of approximately 32.5 acres of herbaceous vegetation. Negligible impacts on wildlife and no takes of marine mammals are anticipated. Implementation of Alternative 4 would have the following impact on threatened and endangered species: no effect on the humpback whale, southern resident killer whale, Steller sea lion, and leatherback sea turtle; may affect but is not likely to adversely affect the marbled murrelet, Puget Sound chinook salmon, Puget Sound steelhead, and bull trout or their respective designated critical habitat. A Phase 1 archaeological survey has been conducted. The Navy continues to consult with the Washington SHPO on mitigation efforts for any potentially adverse effects. No additional hazardous materials and/or waste streams would be generated that cannot be managed by existing functions and facilities.

### **MCBH Kaneohe Bay**

Alternative 4 would homebase two fleet squadrons at MCBH Kaneohe Bay. Potential environmental impacts from this proposed action would include the following: The number of airfield operations, when compared with baseline conditions, would decrease by 16%. The land area within the greater-than-65 dB DNL noise zones would decrease (5%) in comparison with baseline conditions at MCBH Kaneohe Bay. There would be no change in civilian population and no additional incompatible land uses within the greater-than-65 dB DNL noise zones. Regional air quality would not be affected: short-term, temporary construction emissions and projected annual operating emissions would be below the minimum federal threshold of 250 tpy for all criteria pollutants; projected annual operating emissions for all criteria pollutants would decrease. The community surrounding MCBH Kaneohe Bay would experience a slight decrease in the region's population, down 0.3% from baseline conditions, and a decrease in total school district enrollment, down 10.1% from baseline conditions. Regional annual earnings would decrease by \$138.7 million. Facility construction would generate \$136.4 million in one-time con-

struction expenditures, with an overall economic impact of \$412.4 million on the regional economy. There would be no change from baseline conditions in the potential for disproportionately high and adverse impacts on minority and low-income populations and no potential environmental health and safety risks for children. There would be no change to topography and no significant filling or grading, a negligible impact on water quality, no impacts on floodplains or groundwater with proper mitigation as specified in the installation's Stormwater Management Plan, and no impacts on wetlands. Construction of new facilities would result in a permanent loss of vegetation— up to 4 acres of Bermuda grass. Minor impacts on vegetation, negligible impacts on wildlife, and no takes of marine mammals are anticipated. Implementation of Alternative 4 may affect but is not likely to adversely affect the following threatened and endangered species: Hawaiian monk seal, humpback whale, sperm whale, Newell's shearwater, green sea turtle, and hawksbill sea turtle. There would be no effect on the Hawaiian hoary bat, Hawaiian stilt, Hawaiian common moorhen, Hawaiian coot, Hawaiian duck, round-leaved chaff-flower, Puukaa, white hibiscus, yellow hibiscus, Loulu palm, and Ohai threatened and endangered species. Consultation under Section 106 of the National Historic Preservation Act (NHPA) for architectural and archaeological resources was initiated in a letter dated August 30, 2007. The Navy sent a follow-up letter on September 11, 2008 including a determination that the proposed construction will not result in any adverse effects on historic properties. The Navy will continue to consult with the Hawaii SHPO and, based on any findings from the archaeological testing, will work with the Hawaii SHPO to mitigate any potential effects. No additional hazardous materials and/or waste streams would be generated that cannot be managed by existing functions and facilities.

### **NAS North Island**

Alternative 4 would site periodic squadron detachments at NAS North Island. Potential environmental impacts from this proposed action would include the following: The number of airfield operations, when compared with baseline conditions, would decrease by 1%. The land area and population within the greater-than-65 dB DNL noise zones would decrease slightly (1% and 2% respectively) from NAS North Island's baseline conditions. There would be no change from the baseline condition in the potential for disproportionately high and adverse impacts on minority populations, low income populations, and environmental health and safety risks for



children. There would be no incompatible land uses within the greater-than-65 dB DNL noise zones; no construction emissions or impacts on regional air quality; no change in the regional population or total school district enrollment; no significant impact on the regional economy; no impact on topography or soils, floodplains, water quality, groundwater, wetlands, vegetation, or wildlife; no anticipated takes of marine mammals; no effect on threatened and endangered species; no effect on architectural or archaeological resources; and no impact on hazardous materials generation.

### **ES.7.5 Alternative 5**

#### **NAS Jacksonville**

Alternative 5 (the preferred alternative) would homebase five fleet squadrons and the FRS at NAS Jacksonville. Potential environmental impacts from this proposed action would include the following: The number of airfield operations, when compared with baseline conditions, would decrease by 21%. The land area and population within the greater-than-65 dB DNL noise zones would increase (85% and 111% respectively) in comparison with baseline conditions at NAS Jacksonville. Residential land located within the projected greater-than-65 dB DNL noise zones would increase by 41 acres. Regional air quality would not be affected: short-term, temporary construction emissions and projected annual operating emissions would be below the minimum federal threshold of 250 tpy for all criteria pollutants. The community surrounding NAS Jacksonville would experience a slight decrease in the region's population, down 0.7% from baseline conditions, and a decrease in total school district enrollment, down less than 1% from baseline conditions. Regional annual earnings would decrease by \$285.9 million. Facility construction would generate \$53.3 million in one-time construction expenditures, with an overall economic impact of \$167.8 million on the regional economy. There would be no potential for disproportionately high and adverse environmental and human health impacts on low-income populations; however, there would be a potential impact on minority populations and children. There would be no change to topography and no significant filling or grading, a negligible impact on water quality, and no impact on floodplains or groundwater with proper mitigation as specified in the installation's Storm Water Pollution Prevention Plan. Construction of new facilities at NAS Jacksonville would result in a permanent loss of vegetation—approximately 4 acres

of maintained lawn and potentially less than 1 acre of pine stand. No impacts on wetlands, no effects on threatened and endangered species, no adverse effects on wildlife, and no takes of marine mammals are anticipated. There would be no effects on architectural or archaeological resources, and no additional hazardous materials and/or waste streams would be generated that cannot be managed by existing functions and facilities.

### **NAS Whidbey Island**

Alternative 5 (the preferred alternative) would homebase four fleet squadrons at NAS Whidbey Island. Potential environmental impacts from this proposed action would include the following: The number of airfield operations, when compared with baseline conditions, would decrease by less than 1%. The land area within the greater-than-65 dB DNL noise zones would increase slightly (less than 1%) compared with baseline conditions; there would be no additional incompatible land uses within the greater-than-65 dB DNL noise zones. The population exposed to the greater-than-65 dB DNL noise zones would increase (by 605 people); however, this increase is virtually identical to the projected 7% population growth of Island County between 2013 and 2019. Regional air quality would not be affected: temporary construction emissions and projected annual operating emissions for all criteria pollutants would be below the minimum federal threshold of 250 tpy. The community surrounding NAS Whidbey Island would experience a decrease in the region's population, down 1.2% from baseline conditions, with a decrease in total school district enrollment, down 2.2% from baseline conditions. Regional annual earnings would decrease by \$28.8 million. Facility construction would generate \$130.2 million in one-time construction expenditures, with an overall economic impact of \$411.4 million on the regional economy. There would be no change from the baseline conditions in the potential for disproportionately high and adverse impacts on minority and low-income populations and no change in environmental health and safety risks for children. The installation's topography at the primary construction area would be slightly altered by increasing surface elevation an estimated 1 to 2 feet. Approximately 0.2 acres of wetlands would be filled and mitigated in accordance with the required regulations of the State of Washington Department of Ecology and the USACE. With proper mitigation as specified in the installation's Stormwater Management Plan there would be no impact on surface water or groundwater and minor impacts on water quality, but only during construction. Construction of new facilities would result in a permanent loss of

approximately 5.6 acres of herbaceous vegetation. Negligible impacts on wildlife and no takes of marine mammals are anticipated. Implementation of Alternative 5 would have the following impact on threatened and endangered species: no effect on the humpback whale, southern resident killer whale, Steller sea lion, and leatherback sea turtle; may affect but is not likely to adversely affect the marbled murrelet, Puget Sound chinook salmon, Puget Sound steelhead, and bull trout or their respective designated critical habitat. A Phase 1 archaeological survey has been conducted. The Navy continues to consult with the Washington SHPO on mitigation efforts for any potentially adverse effects. No additional hazardous materials and/or waste streams would be generated that cannot be managed by existing functions and facilities.

### **MCBH Kaneohe Bay**

Alternative 5 (the preferred alternative) would homebase three fleet squadrons at MCBH Kaneohe Bay. Potential environmental impacts from this proposed action would include the following: The number of airfield operations, when compared with baseline conditions, would decrease by 10%. The land area within the greater-than-65 dB DNL noise zones would increase (5%) in comparison with baseline conditions at MCBH Kaneohe Bay. There would be no change in civilian population and no additional incompatible land uses within the greater-than-65 dB DNL noise zones. Regional air quality would not be affected: short-term, temporary construction emissions and projected annual operating emissions would be below the minimum federal threshold of 250 tpy for all criteria pollutants, and projected annual operating emissions for all criteria pollutants would decrease. The community surrounding MCBH Kaneohe Bay would experience a slight decrease in the region's population, down 0.2% from baseline conditions, and a decrease in total school district enrollment, down 6.8% from baseline conditions. Regional annual earnings would decrease by \$93.5 million. Facility construction would generate \$147.5 million in one-time construction expenditures, with an overall economic impact of \$445.8 million on the regional economy. There would be no change from baseline conditions in the potential for disproportionately high and adverse impacts on minority and low-income populations, and no potential environmental health and safety risks for children. There would be no change to topography and no significant filling or grading, a negligible impact on water quality, no impact on floodplains or groundwater with proper mitigation as specified in the installation's Stormwater Management Plan, and no impacts on wetlands. Construction also would result in a permanent

loss of vegetation— up to 4 acres of Bermuda grass. Minor impacts on vegetation, negligible impacts on wildlife, and no takes of marine mammals are anticipated. Implementation of Alternative 5 may affect but is not likely to adversely affect the following threatened and endangered species: Hawaiian monk seal, humpback whale, sperm whale, Newell's shearwater, green sea turtle, and hawksbill sea turtle. There would be no effect on the Hawaiian hoary bat, Hawaiian stilt, Hawaiian common moorhen, Hawaiian coot, Hawaiian duck, round-leaved chaff-flower, Puukaa, white hibiscus, yellow hibiscus, Loulu palm, and Ohai threatened and endangered species. Consultation under Section 106 of the National Historic Preservation Act (NHPA) for architectural and archaeological resources was initiated in a letter dated August 30, 2007. The Navy sent a follow-up letter on September 11, 2008 including a determination that the proposed construction will not result in any adverse effects on historic properties. The Navy will continue to consult with the Hawaii SHPO and, based on any findings from the archaeological testing, will work with the Hawaii SHPO to mitigate any potential effects. No additional hazardous materials and/or waste streams would be generated that cannot be managed by existing functions and facilities.

### **NAS North Island**

Alternative 5 (the preferred alternative) would site periodic squadron detachments at NAS North Island. Potential environmental impacts from this proposed action would include the following: The number of airfield operations, when compared with baseline conditions, would decrease by less than 1%. The land area and population within the greater-than-65 dB DNL noise zones would decrease slightly (1% and 2% respectively) from NAS North Island's baseline conditions. There would be no change from baseline conditions in the potential for disproportionately high and adverse impacts on minority populations, low income populations, and environmental health and safety risks for children. There would be no incompatible land uses within the greater-than-65 dB DNL noise zones; no construction emissions or impacts on regional air quality; no change in the regional population or total school district enrollment; no significant impact on regional economy; no impact on topography or soils, floodplains, water quality, groundwater, wetlands, vegetation, or wildlife; no anticipated takes of marine mammals; no effect on threatened and endangered species; no effect on architectural or archaeological resources; and no impact on hazardous materials generation.

### **ES.7.6 Alternative 6**

#### **NAS Jacksonville**

Alternative 6 would homebase five fleet squadrons at NAS Jacksonville. Potential environmental impacts from this proposed action would include the following: The number of air-field operations, when compared with baseline conditions, would decrease by 39%. The land area and population within the greater-than-65 dB DNL noise zones would increase slightly (26% and 37% respectively) in comparison with NAS Jacksonville's baseline conditions. Residential land located within the projected greater-than-65 dB DNL noise zones would increase by 9 acres. Regional air quality would not be affected: short-term, temporary construction emissions and projected annual operating emissions would be below the minimum federal threshold of 250 tpy for all criteria pollutants. The community surrounding NAS Jacksonville would experience a slight decrease in the region's population, down 0.8% from baseline conditions, and a decrease in total school district enrollment, down less than 1% from baseline conditions. Regional annual earnings would decrease by \$328.4 million. Facility construction would generate \$36.7 million in one-time construction expenditures, with an overall economic impact of \$115.4 million on the regional economy. There would be no potential for disproportionately high and adverse environmental and human health impacts on low-income populations; however, there would be a potential impact on minority populations and children. There would be no change to topography and no significant filling or grading, a negligible impact on water quality, and no impact on floodplains or groundwater with proper mitigation as specified in the installation's Storm Water Pollution Prevention Plan. Construction of new facilities would result in a permanent loss of vegetation—approximately 2 acres of maintained lawn. No impacts on wetlands, no effects on threatened and endangered species, no adverse effects on wildlife, and no takes of marine mammals are anticipated. There would be no effects on architectural or archaeological resources, and no additional hazardous materials and/or waste streams would be generated that cannot be managed by existing functions and facilities.

#### **NAS Whidbey Island**

Alternative 6 would homebase four fleet squadrons and an FRS at NAS Whidbey Island. Potential environmental impacts from this proposed action would include the following: The

number of airfield operations, when compared with baseline conditions, would increase by 23%. The land area within the greater-than-65 dB DNL noise zones would increase slightly (less than 1%) from NAS Whidbey Island's baseline conditions; there would be no additional incompatible land uses within the greater-than-65 dB DNL noise zones. The population exposed to the greater-than-65 dB DNL noise zones would increase (by 616 people); however, this increase is virtually identical to the projected 7% population growth of Island County between 2013 and 2019. Regional air quality would not be affected: short-term, temporary construction emissions and projected annual operating emissions would be below the minimum federal threshold of 250 tpy for all criteria pollutants. The community surrounding NAS Whidbey Island would experience a slight increase in the region's population, up 0.1% from baseline conditions, with an increase in total school district enrollment, up 1% from baseline conditions. Regional annual earnings would increase by \$13.7 million. Facility construction would generate \$223.8 million in one-time construction expenditures, with an overall economic impact of \$707.0 million on the regional economy. There would be no change from baseline conditions in the potential for disproportionately high and adverse impacts on minority and low-income populations and no change in environmental health and safety risks for children. The installation's topography at the primary construction area would be slightly altered by increasing surface elevation an estimated 1 to 2 feet. Approximately 2.1 acres of wetlands would be filled and mitigated in accordance with the required regulations of the State of Washington Department of Ecology and the USACE. With proper mitigation as specified in the installation's Stormwater Management Plan there would be no impact on surface water or groundwater and minor impacts on water quality, but only during construction. Construction of new facilities would result in a permanent loss of approximately 21.6 acres of herbaceous vegetation. Negligible impacts on wildlife and no takes of marine mammals are anticipated. Implementation of Alternative 6 would have the following impacts on threatened and endangered species: no effect on the humpback whale, southern resident killer whale, Steller sea lion, and leatherback sea turtle; may affect but is not likely to adversely affect the marbled murrelet, Puget Sound chinook salmon, Puget Sound steelhead, and bull trout or their respective designated critical habitat. A Phase 1 archaeological survey has been conducted. The Navy continues to consult with the Washington SHPO on mitigation ef-

forts for any potentially adverse effects. No additional hazardous materials and/or waste streams would be generated that cannot be managed by existing functions and facilities.

### **MCBH Kaneohe Bay**

Alternative 6 would homebase three fleet squadrons at MCBH Kaneohe Bay. Potential environmental impacts from this proposed action would include the following: The number of airfield operations, when compared with baseline conditions, would decrease by 10%. The land area within the greater-than-65 dB DNL noise zones would increase (5%) in comparison with baseline conditions at MCBH Kaneohe Bay. There would be no change in civilian population and no additional incompatible land uses within the greater-than-65 dB DNL noise zones. Regional air quality would not be affected: short-term, temporary construction emissions and annual operating emissions would be below the minimum federal threshold of 250 tpy for all criteria pollutants; projected annual operating emissions of all criteria pollutants would decrease. The community surrounding MCBH Kaneohe Bay would experience a slight decrease in the region's population, down 0.2% from baseline conditions, and a decrease in total school district enrollment, down 6.8% from baseline conditions. Regional annual earnings would decrease by \$93.5 million. Facility construction would generate \$147.5 million in one-time construction expenditures, with an overall economic impact of \$445.8 million on the regional economy. There would be no change from baseline conditions in the potential for disproportionately high and adverse impacts on minority and low-income populations and no potential environmental health and safety risks for children. There would be no change to topography and no significant filling or grading, a negligible impact on water quality, no impact on floodplains or groundwater with proper mitigation as specified in the installation's Stormwater Management Plan, and no impacts on wetlands. Construction also would result in a permanent loss of vegetation – up to 4 acres of Bermuda grass. Minor impacts on vegetation, negligible impacts on wildlife, and no takes of marine mammals are anticipated. Implementation of Alternative 6 may affect but is not likely to adversely affect the following threatened and endangered species: the Hawaiian monk seal, humpback whale, sperm whale, Newell's shearwater, green sea turtle, and hawksbill sea turtle. There would be no effect on the Hawaiian hoary bat, Hawaiian stilt, Hawaiian common moorhen, Hawaiian coot, Hawaiian duck, round-leaved chaff-flower, Puukaa, white hibiscus, yellow hibiscus, Loulu palm, and Ohai threatened and endangered species. Consultation under Section

106 of the National Historic Preservation Act (NHPA) for architectural and archaeological resources was initiated in a letter dated August 30, 2007. The Navy sent a follow-up letter on September 11, 2008 including a determination that the proposed construction will not result in any adverse effects on historic properties. The Navy will continue to consult with the Hawaii SHPO and, based on any findings from the archaeological testing, will work with the Hawaii SHPO to mitigate any potential effects. No additional hazardous materials and/or waste streams would be generated that cannot be managed by existing functions and facilities.

### **NAS North Island**

Alternative 6 would site periodic squadron detachments at NAS North Island. Potential environmental impacts from this proposed action would include the following: The number of airfield operations, when compared with baseline conditions, would decrease by less than 1%. The land area and population within the greater-than-65 dB DNL noise zones would decrease slightly (1% and 2% respectively) from NAS North Island's baseline conditions. There would be no change from baseline conditions in the potential for disproportionately high and adverse impacts on minority populations, low income populations, and environmental health and safety risks for children. There would be no incompatible land uses within the greater-than-65 dB DNL noise zones; no construction emissions or impacts on regional air quality; no change in the regional population or total school district enrollment; no significant impact on the regional economy; no impact on topography or soils, floodplains, water quality, groundwater, wetlands, vegetation, or wildlife; no anticipated takes of marine mammals; no effect on threatened and endangered species; no effect on architectural or archaeological resources; and no impact on hazardous materials generation.

### **ES.7.7 No Action Alternative**

"No Action" means an action would not take place. The No Action Alternative provides a benchmark so that decision-makers can compare the magnitude of potential environmental effects of the proposed action or alternatives with baseline conditions. Under the No Action Alternative no new or expanded facilities would be constructed, and there would be no increase in functional capacity at any alternative homebasing site. The No Action Alternative does not meet the purpose and need of the proposed action. However, it provides a benchmark using P-3C



flight operations to compare the necessary aircraft operations, personnel transition, and new construction or renovation of structures to accommodate the P-8A MMA. As there would be no change in aircraft numbers, personnel, or mission activities, there would be no corresponding impact or change to any of the resources evaluated in this EIS.

## **1 Introduction**

This Final Environmental Impact Statement (Final EIS) analyzes potential environmental impacts that may result from implementing the U.S. Department of the Navy's (Navy) proposed action to provide facilities and functions to support homebasing 12 P-8A Multi-Mission Maritime Aircraft (MMA) squadrons (72 aircraft) and one fleet replacement squadron (FRS) (12 aircraft) at established maritime patrol homebases. The P-8A MMA will replace the retiring P-3C beginning no later than 2012. Established maritime patrol homebases are Naval Air Station (NAS) Jacksonville, Florida; NAS Whidbey Island, Washington; NAS Brunswick, Maine; and Marine Corps Base Hawaii (MCBH) Kaneohe Bay. However, for the purposes of the proposed action, NAS Brunswick has been eliminated from consideration as a potential homebase because its aircraft and supporting functions are being transferred in their entirety to NAS Jacksonville by 2011 in accordance with the recommendations of the 2005 Base Closure and Realignment Commission (BRAC). In addition, maritime patrol aircraft are periodically detached to NAS North Island, California. Figure 1-1 shows the geographic location of established maritime patrol aircraft homebases.

This environmental analysis was prepared to comply with the National Environmental Policy Act (NEPA) of 1969. It analyzes personnel transition, new construction or renovation of structures, and all airfield operations necessary to accommodate the basing of the P-8A MMA as the Navy phases its current maritime patrol aircraft, the P-3C Orion, out of service. The Navy would use its existing ranges (the same ranges currently used for tactical training of P-3C aircrews) to conduct MMA training operations. Additionally, projected P-8A MMA tactical training operations will be the same as existing P-3C training operations, and the P-8A MMA will employ the same weapons systems and sonobuoys as currently used by the P-3C. The potential environmental impacts associated with these training activities in existing military training ranges are being analyzed separately as part of the Navy's Tactical Training Theater Assessment and Planning program. For further information on air operations and training, see Appendix A, "P-8A MMA Flight Training Operations."

An adjunct capability developed as part of the P-3C retirement and operation of the P-8A MMA is the Broad Area Maritime Surveillance (BAMS) unmanned aircraft system (UAS), a remotely piloted aircraft that provides maritime intelligence, surveillance, and reconnaissance.

BAMS UAS is controlled by satellite using a control station located in a building connected to the base communication system. Because of the similarity of mission, BAMS would be controlled from within the MMA Tactical Support Center (TSC), which is co-located with the P-8A MMA homebasing sites. Thus, the facilities necessary for the BAMS UAS control station have been considered within this document. The BAMS aircraft can be homebased at locations that are separate from the TSC. Potential environmental impacts associated with BAMS will be considered separately upon fielding the BAMS aircraft and development of a basing strategy. As noted, homebase locations for BAMS aircraft and the P-8A MMA are not necessarily linked. However, the potential environmental impacts of the BAMS mission control station located within the TSC are considered in this document because P-8A MMA personnel augment the BAMS command and control functions.

This Final EIS was prepared in accordance with the requirements of the National Environmental Policy Act of 1969; the Council on Environmental Quality (CEQ) regulations implementing NEPA (40 Code of Federal Regulations [CFR] 1500-1508); and Navy procedures for implementing NEPA (32 CFR 775).

### **Baseline Conditions**

This document describes the environmental consequences of providing the facilities and functions needed to support replacement of the P-3C with the P-8A MMA, the Navy's proposed action. To compare probable/possible effects of the proposed action, baseline environmental conditions must first be defined. The year 2011 has been chosen as the baseline year to provide a comparison for the environmental analyses presented in this document. The year 2011 is defined as the baseline year for the affected environment because it is the year prior to the introduction of the P-8A MMA. The analysis takes into account the changes in aircraft and personnel scheduled to occur before the P-8A MMA is introduced the following year, 2012.

Several changes in aircraft and personnel loading are scheduled to occur at existing P-3C homebases before or concurrent with the introduction of the P-8A MMA. These changes include:

- Retiring S-3 operational squadrons at NAS Jacksonville;
- Transferring aircraft to NAS Jacksonville from NAS Brunswick per the 2005 BRAC report; and
- Replacing EA-6B aircraft with EA-18G aircraft at NAS Whidbey Island.



Each of these actions has been considered and incorporated into the baseline conditions specifically related to noise, personnel loading, payroll expenditures, facilities, and infrastructure.

## **1.1 Background**

The P-3C, also known as the Orion, is a turboprop aircraft that has been in service since 1969. Since its introduction, the P-3C has undergone a series of configuration updates, yet the operational concept for the P-3C has remained the same: to provide anti-submarine and anti-surface-warfare capabilities, tactical surveillance, reconnaissance, strike support, fleet support and warning, and monitoring for electromagnetic signals of interest for intelligence analysis.

Originally designed as a land-based, long-range, anti-submarine warfare patrol aircraft, the P-3C's mission expanded in the late 1990s to include surveillance of the entire battle space, either at sea or over land. Its long-range and on-station capability allow views of the battle space and provides instantaneous information to ground troops.

***On-Station Capability***  
On-station capability refers to the amount of time an aircraft actually spends on mission activities and does not include transit time to or from the air station.

The P-3C aircraft has served past its intended lifetime and has been modified to extend its service life beyond the original design. The original service-life goal for the P-3C was 7,500 flight hours; however, P-3C aircraft are operating with 18,000 to 20,000 flight hours, considerably longer than their planned service life. The years of high utilization rates have resulted in metal fatigue that has made extending the life of the existing P-3C aircraft cost-prohibitive.

Several ongoing programs maintain the aging P-3C in order to meet operational readiness requirements. The P-3C Critical Obsolescence Program began in 2004 to improve aircraft availability by replacing obsolete systems. As part of the P-3C Service Life Assessment Program, the aircraft undergoes special inspections of wings and other structural components to evaluate aircraft-fatigue-damage accrual estimates, flight hour limits, operational availability, and reliability. Necessary repairs are made to refurbish the aircraft, extending its service life. These P-3C refurbishment programs ensure that the P-3C remains a viable aviation asset until a replacement program for the aircraft is implemented and achieves full operational capability.

In the mid-1980s, the Navy began studies for a replacement aircraft for the P-3C. The Navy specifications for the new aircraft required reduced operating and support costs. In 2000,

several U.S. Department of Defense (DoD) contractors participated in a competition for the development of a replacement aircraft.

In 2004, the Office of the Secretary of Defense chose Boeing's P-8A MMA design, a militarized variant of the 800-series 737 commercial aircraft to replace the P-3C. To adapt the 737 aircraft to perform the current and projected maritime patrol force missions of the P-3C, the commercial design was modified by adding weapons systems, strengthening wings, and adding fuel tanks. Boeing was awarded the contract for the system development and demonstration phase of the P-8A MMA program on June 14, 2004. The P-8A MMA program completed a successful preliminary design review in November 2005 and a critical design review in June 2007.

The P-8A MMA is designed to execute, with increased capabilities, maritime patrol missions currently performed by the P-3C. These functions include the primary mission areas of armed anti-submarine warfare; armed anti-surface warfare; intelligence; command, control, and communications; command and control warfare; mine warfare; and mobility. Secondary mission areas include strike warfare; missions of state; non-combatant operations; fleet support operations; anti-air warfare; amphibious warfare; and homeland defense.

## **1.2 Purpose and Need**

The purpose of the proposed action is to provide facilities and functions that support homebasing the P-8A MMA at established maritime patrol homebases. This would allow the Navy to efficiently and economically retire P-3C aircraft and transition P-8A MMA into the fleet while maintaining a maritime patrol capability that sustains national defense objectives and policies. The homebased P-8A MMA would provide increased mission reliability while requiring a smaller force and less maintenance infrastructure. After transition, the maritime patrol mission would be accomplished by 12 P-8A MMA fleet squadrons (72 aircraft) and one FRS (12 aircraft). Maritime patrol squadrons are currently homebased at or are detached to five installations in the continental U.S. and Hawaii; however, there will be only four installations when NAS Brunswick is closed, in accordance with BRAC 2005 recommendations.

Achieving timely and efficient aircraft replacement is of paramount consideration, given the aging fleet of P-3C aircraft, the associated costs of extending their service life, and concerns regarding their continued reliability to meet operational readiness requirements. Since full P-3C retirement from the fleet is scheduled to occur in 2019, timely and efficient transition of aircraft

and maritime patrol and reconnaissance facilities and functions is necessary. Maintaining existing command and control functions and aircrews at existing established maritime patrol bases, coupled with potential reuse or renovation of existing infrastructure and functions wherever possible or practicable, would facilitate the quick and efficient transition from the P-3C to the P-8A MMA. Established installations possess the following general support characteristics, making them uniquely positioned to receive the P-8A MMA in an efficient timeframe:

- Technical expertise in successfully carrying out P-3C mission activities, which the P-8A MMA mission activities would mirror closely;
- Personnel vested in the Patrol and Reconnaissance Wing and in facilitating the Navy's maritime patrol capabilities;
- Existing ranges (the same ranges currently used for training P-3C aircrews) that are in proximity to established bases and would continue to be available for conducting MMA training operations; and
- Existing land-use controls and community outreach addressing Patrol and Reconnaissance Wing mission activities.

All of these characteristics would facilitate the transition to the P-8A MMA within the defined timeline. Installations being considered for homebasing the P-8A MMA have already undergone facility evaluations in order to ensure maximum use of existing infrastructure.

In addition to the potential for reuse of existing facilities, homebasing the P-8A MMA at established maritime patrol bases would also have the advantage of allowing the co-location of Patrol and Reconnaissance Wing Command and control functions with existing P-3C and transitioned P-8A MMA aircrews. This co-location of operational assets would minimize the potential for disruptions in the performance of the maritime patrol mission as the rolling transition of the new P-8A MMA into fleet squadrons begins (no later than 2012). The mechanics of the rolling transition would necessitate taking one squadron out of training and deployment rotation and re-training crews to support the new aircraft. During this transition period, both P-3C aircraft and P-8A MMA would support the maritime missions. As personnel are fully integrated into the P-8A MMA program, P-3C aircraft would be progressively retired, thus avoiding major interruptions in service and allowing the fleet to maintain combat readiness.

Once transitioned, the P-8A MMA and its aircrews would be positioned to continue to meet the Navy's need to sustain the national security needs of the United States by maintaining a robust maritime patrol capability. As identified above, the P-8A MMA has been specifically de-

signed by the Navy to become the next-generation Navy maritime patrol aircraft. Under the proposed action, the P-8A MMA would perform the P-3C's mission in both maritime and littoral environments (i.e., on or near a shore).

The overall maritime patrol mission is an integral component of the Navy's operational mission, as described in Sea Power 21. Sea Power 21 is the Navy's program for aligning, organizing, integrating, and transforming Naval forces for a new era and a new national homeland defense strategy. Sea Power 21 aligns the Navy's capabilities under four fundamental concepts—SEA SHIELD, SEA STRIKE, SEA BASE, and FORCEnet.

- **SEA SHIELD** addresses Naval capabilities to defend Naval, joint, and coalition forces while sustaining global maritime trade and military operations. SEA SHIELD extends homeland defense capabilities by providing a forward presence, protecting fixed geographical areas, and networking intelligence-gathering capabilities.
- **SEA STRIKE** uses maritime patrol aircraft, ships, submarines, and unmanned vehicles to maneuver Naval, joint, and coalition combat forces and to intercept threats.
- **SEA BASE** serves as a foundation for both offensive and defensive forces by providing pre-positioned warfighting capabilities and integrated logistic support for operational readiness, rapid deployment, and sustained combat operations.
- **FORCEnet** interconnects the Naval capabilities of SEA SHIELD, SEA STRIKE, and SEA BASE. FORCEnet aligns information and communication networks to rapidly process intelligence, surveillance, and reconnaissance information; integrate tactical weapons and communication capabilities of combined combat forces; and support the command and control components of Naval, joint, and coalition forces.

The P-8A MMA program is consistent with and furthers the Naval operations identified by Sea Power 21. The aircraft may serve as both a forward-deployed and ready rapid-response combat asset, providing first-on-the-scene situational awareness for successful land and maritime operations by gathering and relaying time-sensitive information to Naval, joint, and coalition force commanders. The aircraft has the capability to identify, track, and target enemy threats in littoral regions, maritime trade shipping lanes, and military operating areas at sea and on land. With its anti-submarine warfare and anti-surface warfare capabilities, the P-8A MMA can protect carrier strike groups and expeditionary strike groups against hostile submarine and surface threats in offshore operating areas.

The P-8A MMA would provide aircrews with similar capabilities to conduct its designated homeland defense mission. Homeland defense is accomplished through the integration of forward-deployed Naval forces with other military services, intelligence and law-enforcement



agencies, and civil authorities. By identifying, tracking, and intercepting potential dangers, a secure homeland can remain unthreatened. Homeland defense operations extend the security of the United States far seaward, taking advantage of the time and space afforded by Naval forces to shield our nation from impending threats.

### **1.3 Public Involvement**

#### **Scoping**

The purpose of scoping is to provide the public and other interested parties with information about the proposed action and to obtain comments to assist in identifying key issues for further analysis. This process helps refine or frame the analysis for the draft EIS. The scoping period for the P-8A MMA draft EIS began with the publication of the Navy's Notice of Intent (NOI) to prepare an EIS in the *Federal Register* on December 27, 2006. The public scoping period officially began on December 27, 2006 and closed on March 2, 2007. Between December 2006 and March 2007, the Navy provided several notifications of its intent to prepare an EIS and invited public participation in identifying the scope and significance of issues related to the proposed action. Specifically, the Navy released notification and coordination letters, established a public website, and published notices/advertisements in local daily and weekly newspapers.

Notification and coordination letters were sent to federal, state, and local government agencies and to non-governmental groups and individuals most likely to be interested in the proposed action. The letters described the proposed action and alternatives, provided background information on the proposed action, and outlined environmental considerations and public participation opportunities. The letters were mailed concurrently with the publication of the NOI in the *Federal Register*.

Notices announcing the Navy's intent to prepare an EIS and to hold public-scoping open houses were published in local daily and weekly newspapers. The newspaper announcements coincided with the publication of the NOI in the *Federal Register* and were repeated in the weeks preceding each of the scheduled open houses. A listing of the newspapers publishing the notices and corresponding publication dates is provided in Table 1-1.

**Table 1-1 Newspaper Notifications and Display Advertisement Schedule**

Newspaper	Publication Days/Dates
<i>Florida Times Union</i>	December 27, 2006 and January 7 and 11, 2007
<i>Clay Today</i>	December 28, 2006 and January 11, 2007
<i>Honolulu Advertiser</i>	December 29, 2006 and January 14 and 18, 2007
<i>Honolulu Star Bulletin</i>	December 28, 2006 and January 14 and 18, 2007
<i>San Diego Union Tribune</i>	December 28, 2006 and February 4 and 8, 2007
<i>Coronado Eagle</i>	January 31, 2007 and February 7, 2007
<i>Whidbey News-Times</i>	December 27, 2006 and February 10 and 14, 2007
<i>Seattle Times</i>	December 28, 2006 and February 11 and 15, 2007

The Navy issued a press release coinciding with distribution of scoping notification letters and developed a publicly accessible website (<http://www.MMAEIS.com>). Website availability was announced in all scoping notification material. The website provided a description of the proposed action and alternatives, information about the NEPA process, public involvement opportunities, a project schedule, and an opportunity to provide written comments electronically. Between January 1, 2007, and March 2, 2007 (the end of the scoping period), the website was visited 15,511 times. The website was updated periodically throughout the scoping process.

**Scoping Meetings.** Four public scoping meetings were held in January and February 2007, organized in an open house format. These meetings provided the public an opportunity to review project information, ask questions about the Navy's proposed action, voice their specific concerns to project representatives, and submit written comments. Table 1-2 details the scoping meeting locations, times, and dates. Table 1-3 shows the number of attendees and total number of comments generated throughout the scoping period.

**Table 1-2 Public Scoping Meeting Schedule**

Day/Date	Time	Location
Thursday, January 11, 2007	5:00-8:00 p.m.	Holiday Inn, Orange Park 150 Park Avenue Orange Park, FL 32073
Thursday, January 18, 2007	5:00-8:00 p.m.	Pacific Beach Hotel 2490 Kalakaua Avenue Honolulu, HI 96815
Thursday, February 8, 2007	5:00-8:00 p.m.	Coronado Public Library 640 Orange Avenue Coronado, CA 92118
Thursday, February 15, 2007	5:00-8:00 p.m.	Oak Harbor School District Office, Board Room 350 South Oak Harbor Street Oak Harbor, WA 98277

**Table 1-3 Number of Attendees per Scoping Meeting and Comments Received**

	Scoping Meeting Location				Grand Total
	Jacksonville, FL	Honolulu, HI	North Island, CA	Whidbey Island, WA	
Total Attendees	45	22	5	14	<b>86</b>
Number of Comments Received	14	6	0	9	<b>29</b>

Note: Total number of comments received includes written comments submitted at scoping meetings, electronic comments received via the public website, and those received via mail and fax.

**Public Concerns.** Issues of public concern and areas of perceived potential impact identified during the scoping process are summarized below. The Navy received 29 comments from the public and agencies during the scoping period. Issues of concern noted by members of the public, including state and congressional representatives, as summarized below, are categorized by topics that are addressed in this EIS.

- **Mailing List.** Commenters, including officials, organizations, and individuals, asked to be added to the mailing list.
- **Future Meetings.** Suggestions for alternative locations for holding future public meetings were made.
- **Alternatives.** Commenters expressed support or opposition for alternative homebasing sites; some suggested alternative locations both in the continental United States and in the Pacific.
- **Operations.** Information was requested on operations, operational costs, flight patterns, take-off and approach profiles, and holding patterns and how they could change under the proposed action.
- **Weaponry.** Information was requested regarding types of weapons carried by the P-8A MMA and possible dangers to the public.
- **Safety.** Commenters asked about the safety of the landing patterns.
- **Noise Impact.** Some commenters thought the proposed action would reduce noise and others were concerned about increased noise.
- **Coastal Consistency.** Commenters requested the proposed action be consistent with state Coastal Zone Management Acts.
- **Air Quality.** Potential health and environmental effects associated with an increase in air emissions were noted.
- **Socioeconomics.** Commenters requested further information on how the proposed action could influence housing markets, traffic loads, and local community schools.
- **Community Services.** Commenters asked about impacts on community services.
- **Traffic.** Commenters were concerned about overcrowding local roads.

- **Vegetation and Wildlife.** Commenters expressed concern about negative impacts on marine ecosystems and requested that the EIS present subsequent findings.
- **Water Quality and Use.** Water quality impacts from storm water and wastewater run-off and impacts on availability of potable water that might arise from increases in support personnel were a concern of some commenters.
- **Lights.** Comments about impacts on the natural nighttime sky and the lighting environment were made.
- **Cultural Resources.** The impact of the proposed action on cultural resources was a concern.
- **Environmental Hazards.** Commenters requested information about the effects of the proposed action with respect to potential tsunamis and hurricane storm surges in areas of low elevation.
- **Hazardous Materials.** Some questions were noted about impacts associated with fuel spills; information on P-8A MMA fuel storage systems and spill containment procedures was requested.
- **Cumulative Impacts.** Commenters requested cumulative impact information.

**Federal and State Agency Scoping Review Comments.** The Navy forwarded notification and coordination letters to federal, state, and local government agencies, non-governmental groups, and individuals most likely to be interested in the proposed action. The Navy received comments on the scope of the EIS and potentially significant issues from the following federal and state review agencies:

- Department of Land and Natural Resources, Hawaii (both the Commission on Water Resource Management and the Division of Aquatic Resources);
- Miccosukee Tribe of Indians of Florida;
- Florida Department of State, Division of Historical Resources;
- Florida Department of Environmental Protection;
- State of Washington Department of Archaeology and Historic Preservation; and
- Washington State Department of Fish and Wildlife.

In general, comments provided information on permits needed and/or resources that could be affected by the proposed action and suggested information to include in developing the draft EIS.

## **The Public Hearing Process**

The public hearing process provides the opportunity for stakeholders (including government agencies, special interest groups, and private citizens) to evaluate the draft EIS and determine whether it adequately addresses environmental issues of concern expressed during the scoping process. Throughout the P-8A MMA draft EIS public hearing process, comments on the draft EIS were received and compiled for consideration during the preparation of the Final EIS. The 45-day draft EIS public comment period began when the Notice of Availability (NOA) and Notice of Public Hearings (NOPH) were published in the *Federal Register* on March 7, 2008 (see Appendix B). The 45-day public comment period ended on April 25, 2008.

Subsequent to the release of the NOA in the *Federal Register*, the Navy provided several notifications of the NOA and NOPH and invited members of the public to comment on the draft EIS. Specifically, the Navy sent notification letters to federal, state, and local government agencies; elected officials; and additional interested agencies, organizations, and individuals that had identified themselves by submitting comments during the scoping process or by requesting notification. The notification package included information containing the NOA and public hearing meeting schedule.

Concurrent with publication in the *Federal Register*, paid advertisements providing notification of the NOA and the public hearing meeting schedule were published in local and regional newspapers (Table 1-4). In addition to paid advertisements, the Navy also communicated public hearing dates through press releases to local print, television, radio media, and internet news sources. The Navy distributed an initial press release on March 7, 2008, and an additional press release was distributed on March 28, 2008. The day prior to the public hearings at NAS Jacksonville, NAS Whidbey Island, and MCBH Kaneohe Bay, the Navy conducted media availability events for local print and television media. These events gave the media an opportunity to view the display stations and fact sheets that would be available for the public hearings and to interview Navy personnel. Local news media ran multiple stories around the public hearings.

The public website (<http://www.MMAEIS.com>) was updated concurrently with the publication of the NOA and NOPH in the *Federal Register*. The project website provided information such as the NOA, the NOPH, electronic copies of the draft EIS, locations where electronic and paper copies of the draft EIS were available locally, the public hearing schedule, and an opportunity for members of the public to provide written comments electronically. Between

March 7 and April 25, 2008 (the end of the public comment period), the website was visited 1,915 times.

**Table 1-4 Newspaper Notifications and Display Advertisement Schedule – Public Hearings**

<b>Newspaper</b>	<b>Publication Dates</b>
<i>Whidbey News-Times</i>	March 12, 19, 22, and 26
<i>Seattle Times</i>	March 12, 19, 24, 25, and 26
<i>Honolulu Advertiser</i>	March 18, 25, 28, 29, and 30
<i>Honolulu Star Bulletin</i>	March 18, 25, 27, 28, and 29
<i>San Diego Union Tribune</i>	March 20, 27, 30, 31, and April 1
<i>Coronado Eagle</i>	March 19, 26, and April 2
<i>Florida Times Union</i>	March 26, April 2, 5, and 6
<i>Clay Today</i>	March 27 and April 3

**Public Hearings.** Four public hearings were held in March and April 2008 and included public information sessions followed by formal public hearings. The public hearings provided interested parties an opportunity to review the draft EIS, ask questions about the draft and voice specific concerns to project representatives, submit written comments, and provide verbal comments as part of the public hearing. Table 1-5 details the public hearing locations, times, and dates. Table 1-6 shows the total number of commenters and total number of comments generated throughout the public comment period. As shown in Table 1-6, a total of 60 people attended the four public hearings, with 11 people providing verbal comments as part of the public hearings. The Navy received an additional 14 written comments, including written comments submitted at the public hearings, via the public website, and by mail or fax. Many of the comments submitted identified multiple issues (see list below). When categorized by the issue addressed, the Navy received a total of 94 comments.

**Table 1-5 Public Hearing Meeting Schedule**

<b>Day/Date</b>	<b>Time</b>	<b>Location</b>
Wednesday, March 26, 2008	4:30-9:00 p.m.	Oak Harbor School District ASC Boardroom 350 South Oak Harbor Street Oak Harbor, WA 98277
Tuesday, April 1, 2008	4:30-9:00 p.m.	J.B. Castle High School 45-386 Kaneohe Bay Drive Kaneohe, HI 96744
Thursday, April 3, 2008	4:30-9:00 p.m.	Crown Hall, Early Childhood Development Center 199 Sixth Street Coronado, CA 92118

**Table 1-5 Public Hearing Meeting Schedule (continued)**

Day/Date	Time	Location
Wednesday, April 9, 2008	4:30-9:00 p.m.	Howard Johnson Inn, Clay/Duval Room 150 Park Avenue Orange Park, FL 32073

Note: An open informational session was held from 4:30 p.m. to 6:30 p.m. to provide interested individuals with the opportunity to review information presented in the draft EIS. Navy representatives were available during the information session to answer related questions. The public hearing was open from 7:00 p.m. to 9:00 p.m.

**Table 1-6 Number of Commenters and Comments Received during the Public Comment Period**

	Public Hearing Location				
	Whidbey Island, WA	Kaneohe Bay, HI	North Island, CA	Jacksonville, FL	Grand Total
Total Attendees (Public Hearings)	19	19	3	19	<b>60</b>
Total Commenters <sup>1</sup>	4	8	0	6	<b>18</b>
Number of Verbal Comments Received	0	8	0	3	<b>11</b>
Number of Written Comments Received <sup>2</sup>	5	5	0	4	<b>14</b>

Notes:

<sup>1</sup> Total number of commenters includes individuals and agencies who submitted verbal or written comments as part of the public hearings and those who submitted comments via the public website or mail and fax.

<sup>2</sup> The number of written comments received includes written comments submitted at scoping meetings, electronic comments received via the public website, and those received via mail and fax.

**Public Comments.** Issues commented on by members of the public, including local and state representatives, are summarized below and categorized by topics addressed in the Final EIS. Comments received during the public comment period, and the Navy's responses to these comments, are included in their entirety in Appendix C.

- **Alternatives (15 comments).** Commenters expressed support or opposition for alternative homebasing sites; some suggested alternative locations both in the continental United States and in the Pacific.
- **Public Involvement (12 comments).** Concerns were raised regarding the public notification process and the availability of the draft EIS for public review.
- **Air Operations (2 comments).** Commenters expressed concerns about aircraft operating outside standard flight tracks and over residential areas.
- **Personnel Numbers (2 comments).** Commenters raised questions about personnel numbers, specifically, personnel increases or decreases at the homebasing sites.
- **Weaponry (2 comments).** Information was requested regarding types of weapons carried by the P-8A MMA and stored at the homebasing sites and possible dangers to the public.

- **Safety (3 comments).** Commenters expressed concerns regarding the risk of aircraft accidents and other emergencies.
- **Noise Impacts (26 comments).** Commenters raised issues regarding the methodology used in the draft EIS to measure noise and expressed concerns that noise would increase with the introduction of the P-8A MMA.
- **Air Quality (1 comment).** Concerns were raised about local air quality.
- **Socioeconomics (2 comments).** Commenters suggested that the Final EIS analyze potential impacts on property values as a result of an increase in noise and potential impacts resulting from the P-8A MMA not being introduced at the homebasing sites.
- **Traffic (1 comment).** The commenter was concerned that traffic would increase on local roads.
- **Water Quality (3 comments).** Commenters noted that studies on storm water runoff were not included in the draft EIS and would have to be completed.
- **Biological Resources (3 comments).** Commenters expressed concerns regarding endangered species consultations and invasive species.
- **Cultural Resources (3 comments).** Concerns were raised about impacts on cultural resources due to construction.
- **Cumulative Impacts (2 comments).** Concerns were raised regarding the scope of the cumulative impacts analysis.
- **General (17 comments).** Comments in support of the proposed action were received as well as more specific comments regarding addressing the scoping comments in the draft EIS, the extent of data-gathering during the scoping process, use of technical language in the draft document, omission of the noise report in paper copies of the draft EIS, and assignment of levels of significance to impacts identified in the document. Additionally, some commenters requested copies of the transcripts generated at the public hearings.

**Federal and State Agency Scoping Review Comments.** The Navy forwarded notification letters to federal, state, and local government agencies; non-governmental groups; and individuals who had requested to be notified during the scoping process. The Navy received comments on the draft EIS from the following federal and state review agencies:

- U.S. Army Corps of Engineers (USACE), Seattle District;
- U.S. Department of the Interior;
- U.S. Environmental Protection Agency (EPA);
- Florida Department of Environmental Protection;
- Hawaii Department of Land and Natural Resources, Division of Forestry and Wildlife; and
- Hawaii Office of Hawaiian Affairs.



In general, comments from the agencies provided information on required permits and jurisdictional determination of wetlands (i.e., the USACE [see Section 6]), requested further consultation or analysis for various resource areas (the Hawaii State Historic Preservation Office [see Section 8]), or noted an agency's lack of objection to the proposed action (EPA).

## **1.4 Changes from the Draft EIS to the Final EIS**

In March 2008, the Navy published an NOA in the *Federal Register* on the availability for public review of a draft EIS to introduce the P-8A MMA into the U.S. Navy Fleet. Subsequent to the release of the draft EIS, updates to technical data and studies were incorporated into the analysis in this Final EIS.

These changes include:

- Corrections to the baseline annual air operations for P-3C aircraft and the distinction between P-3C and EP-3 aircraft<sup>1</sup> operations at NAS Whidbey Island. Changes to the P-3C and EP-3 baseline air operations were made to more consistently represent the respective aircraft flight syllabi. The corrections resulted in changes to the discussion on air operations, noise, and land use for NAS Whidbey Island.
- Corrections to the baseline annual air operations for P-3C aircraft and the distinction between P-3C and P-3C Update operations at NAS Jacksonville and MCBH Kaneohe Bay. Changes to the P-3C and P-3C Update baseline air operations were made to more consistently represent the respective aircraft flight syllabi. The corrections resulted in changes to the discussion on air operations, noise, and land use for NAS Jacksonville and MCBH Kaneohe Bay.
- Revisions to the proposed facility construction footprint at NAS Whidbey Island to minimize wetland impacts and to accommodate operational requirement concerns. The revisions resulted in changes to the natural resources analysis for NAS Whidbey Island.
- Identification and evaluation of mitigative measures to address wetland impacts at NAS Whidbey Island, requiring revisions to the natural resources and wetland analysis for NAS Whidbey Island.
- An expanded noise analysis, including specific sound exposure level (SEL) modeling at each installation to address concerns raised during the public hearing process (see Sections 4.2, 6.2, and 8.2).
- Public comments received during the 45-day public comment period from oral and written statements at public hearings, from the project website, and from written correspondence.
- Final consultation efforts with regulatory agencies.

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<sup>1</sup> The EP-3 aircraft are not part of the P-8A MMA replacement action.

## 2 Proposed Action and Alternatives

### 2.1 Proposed Action

The proposed action is to provide facilities and functions that support homebasing of the P-8A MMA at established maritime patrol homebases. The proposed action would, at program's completion, replace 120 P-3C aircraft (12 fleet squadrons, 108 fleet aircraft, plus one fleet replacement squadron [FRS] with 12 aircraft) with a total of 84 P-8A MMA (12 fleet squadrons, 72 fleet aircraft, plus one FRS squadron with 12 aircraft) split primarily between East and West Coasts, with a continued presence in Hawaii and periodic detachments at NAS North Island, California, to support training requirements. Additionally, the FRS would be co-located at one of the continental U.S. Main Operations Bases (MOBs).

Under the proposed action, each fleet squadron would consist of 6 aircraft, 12 crews, and 35 supporting personnel. Each crew would be composed of five officers and four enlisted personnel. In total, a fleet squadron would require 143 personnel.

An FRS consists of 12 aircraft and the appropriate complement of instructors to train officers and enlisted personnel. In total, the FRS would require 417 personnel.

Table 2-1 provides a comparison of the personnel and aircraft loadings for P-3C and P-8A MMA squadrons. More detailed personnel loadings per base and per alternative are provided in Section 2.3, Infrastructure Requirements.

***Fleet Replacement Squadron (FRS).*** A complement of aircraft and instructors used to train aircrew members for the fleet squadrons. It is responsible for the “post-graduate” training of newly designated Naval Aviators and other flyers returning to flight status after non-flying assignments or transitioning to a new aircraft for duty in the fleet. The FRS is the “schoolhouse” for each type of aircraft, fostering professional standardization and a sense of community. Co-location of the FRS with fleet squadrons provides immediate and daily access to the full resources of the aircraft community: senior leadership, guidance and policies, tactical development, and overall fleet experience. The FRS for the P-8A MMA comprises 12 aircraft.

**Table 2-1 Comparison of P-3C Aircraft and P-8A Multi-Mission Maritime Aircraft Squadron Composition**

Element for Comparison	P-3C Aircraft	P-3C FRS Aircraft	P-8A MMA	P-8A MMA FRS
Personnel per Squadron	346	662	143	417
Primary Aircraft Authorized per Squadron	9	12	6	12
Total Number of Squadrons	12	1	12	1
Total Personnel	4,152	662	2,616 (includes 900 CLS)	533 (includes 116 CLS)
<b>Total Primary Aircraft Authorized</b>	<b>108</b>	<b>12</b>	<b>72</b>	<b>12</b>

Note: The same aircrew personnel who operate the P-3C aircraft would be trained to operate the P-8A MMA.

Key:

- CLS = Contractor logistics support.  
FRS = Fleet Replacement Squadron.  
MMA = Multi-mission maritime aircraft.

The first P-8A MMA would be delivered to the FRS no later than 2012. Initial operating capability (IOC) would occur when the first P-8A MMA fleet squadron is ready to be deployed in 2013, replacing and retiring the first P-3C aircraft formerly assigned to that fleet squadron. The Navy timeline for P-3C retirement, including curtailing maintenance practices and support functions, would act as the primary driver for transition to the P-8A MMA. Full operating capability (FOC) would occur when the last P-3C fleet squadron is transitioned to the P-8A MMA in 2019.

***Initial Operating Capability (IOC)***

IOC is established when one P-8A MMA squadron is fully trained and equipped, ready to deploy.

***Full Operating Capability (FOC)***

FOC is achieved when the fleet can perform all its designated maritime patrol missions with the P-8A MMA (all P-3C squadrons have been transitioned).

To avoid interruption or impediment to operations or combat readiness, the following schedule would be implemented:

- **Maintain the P-3C through 2019.** P-3C aircraft are approaching the end of their operational service life. In order to maintain full operational capability through 2019, an adequate number of P-3C aircraft would be kept viable through inspection and refurbishment until the transition to the P-8A MMA is complete. However, failure to replace P-3C aircraft by 2019 would affect combat readiness, result in interruptions in operations, and accrue costs of extending the service life of the aircraft. The primary goal of the P-3C replacement program is to provide aircraft that are effective and suitable for their intended maritime missions, thereby avoiding interrupting or impeding operations or combat readiness.

- **Initiate P-8A MMA transition no later than 2012.** In order to meet the 2019 date for full P-3C retirement from the fleet, the new P-8A MMA need to begin transitioning into fleet squadrons no later than 2012. The transition would necessitate taking one squadron out of training and deployment rotation and re-training crew members to support the new aircraft. During this transition period, both P-3C aircraft and P-8A MMA would support the maritime missions. As personnel are fully integrated into the P-8A MMA program, P-3C aircraft would be progressively retired, thus avoiding major interruptions in service and allowing the fleet to maintain combat readiness. The proposed seven-year transition period, 2012 to 2019, is the minimum requisite time to fully integrate this new aircraft. Assuming the first P-8A MMA homebase is equipped with the required supporting infrastructure, the first squadron of P-8A MMA would be transitioned beginning no later than 2012.
- **Provide adequate facilities in support of the P-8A MMA transition.** The Navy has conducted facility evaluations of the installations being considered for homebased replacement aircraft. A key component to meeting the rigorous transition timeline is the use of existing infrastructure (see Section 1.2, Purpose and Need, and Section 2.3, Infrastructure Requirements). Each installation requires some new construction, facility renovation, or utility upgrades in order to accommodate the new aircraft.

The P-8A MMA would include the latest capabilities of the P-3C and incorporate state-of-the-art communication and navigation systems. The P-8A MMA also would be capable of being refueled in-flight, allowing it to provide extended range and on-station capabilities. Table 2-2 provides a comparison of the characteristics of the P-3C and the P-8A MMA.

**Table 2-2 Comparison of P-3C Aircraft and P-8A Multi-Mission Maritime Aircraft**

Feature	P-3C Aircraft	P-8A MMA
Primary Function	Anti-Submarine and Anti-Surface Warfare	Anti-Submarine and Anti-Surface Warfare
Length	116 feet 8 inches	129 feet 6 inches
Tail Height	33 feet 8 inches	42 feet 2 inches
Wing Span	99 feet 7 inches	124 feet 6 inches
Maximum Take-off Weight	139,760 pounds	188,200 pounds
Engines	Four Allison T56-A turboprop engines	Two CFM56-7B turbofan engines
Range	1,346 nautical miles (1,550 miles) with 3 hours on-station	1,200 nautical miles (1,381 miles) with 4 hours on-station
Ceiling	28,300 feet	41,000 feet
Crew Members	11	9
Weapons Armament	Torpedoes, cruise missiles, bombs, and mines	Torpedoes, cruise missiles, bombs, and mines
Maximum Air Speed	411 knots	490 knots

Source: Commander Naval Air Force 2007

### **2.1.1 Aircraft Replacement Locations**

As noted previously, the proposed action is to provide facilities and functions to support the replacement of P-3C aircraft with P-8A MMA at established maritime patrol homebases. Aircraft would be replaced at maritime patrol homebases currently supporting P-3C aircraft. Homebasing the P-8A MMA at existing P-3C installations would decrease the time and cost associated with the transition process while maintaining a maritime patrol capability that sustains national defense objectives and policies. Currently, P-3C patrol squadrons (12 squadrons, 144 crew members, with a total of 108 aircraft, plus 12 aircraft in the FRS) are based at NAS Jacksonville, Florida; NAS Brunswick, Maine; NAS Whidbey Island, Washington; and MCBH Kaneohe Bay, Hawaii, with periodic detachments at NAS North Island, California.

NAS Brunswick is not being considered as a potential homebase because all aircraft and supporting functions at this base are being transferred in their entirety to NAS Jacksonville per the 2005 BRAC recommendations.

NAS North Island is included in the alternatives analysis as the location for temporary detachment operations to support training in Southern California (SOCAL) operating areas. Historically, training detachments of P-3C aircraft, primarily from NAS Whidbey Island and MCBH Kaneohe Bay, deploy temporarily to NAS North Island for training sorties. P-3Cs detach for short periods of time to SOCAL training ranges before returning to their MOB. (Detachments typically last 14 days; over the course of a year detachments are present at NAS North Island approximately 180 days.) The proposed action would mirror established training procedures by siting a periodic rotational detachment of P-8A MMA at NAS North Island.

### **2.1.2 Site Descriptions**

NAS Jacksonville, NAS Whidbey Island, NAS North Island, and MCBH Kaneohe Bay are being considered as potential bases to support the replacement of P-3C aircraft with the P-8A MMA.

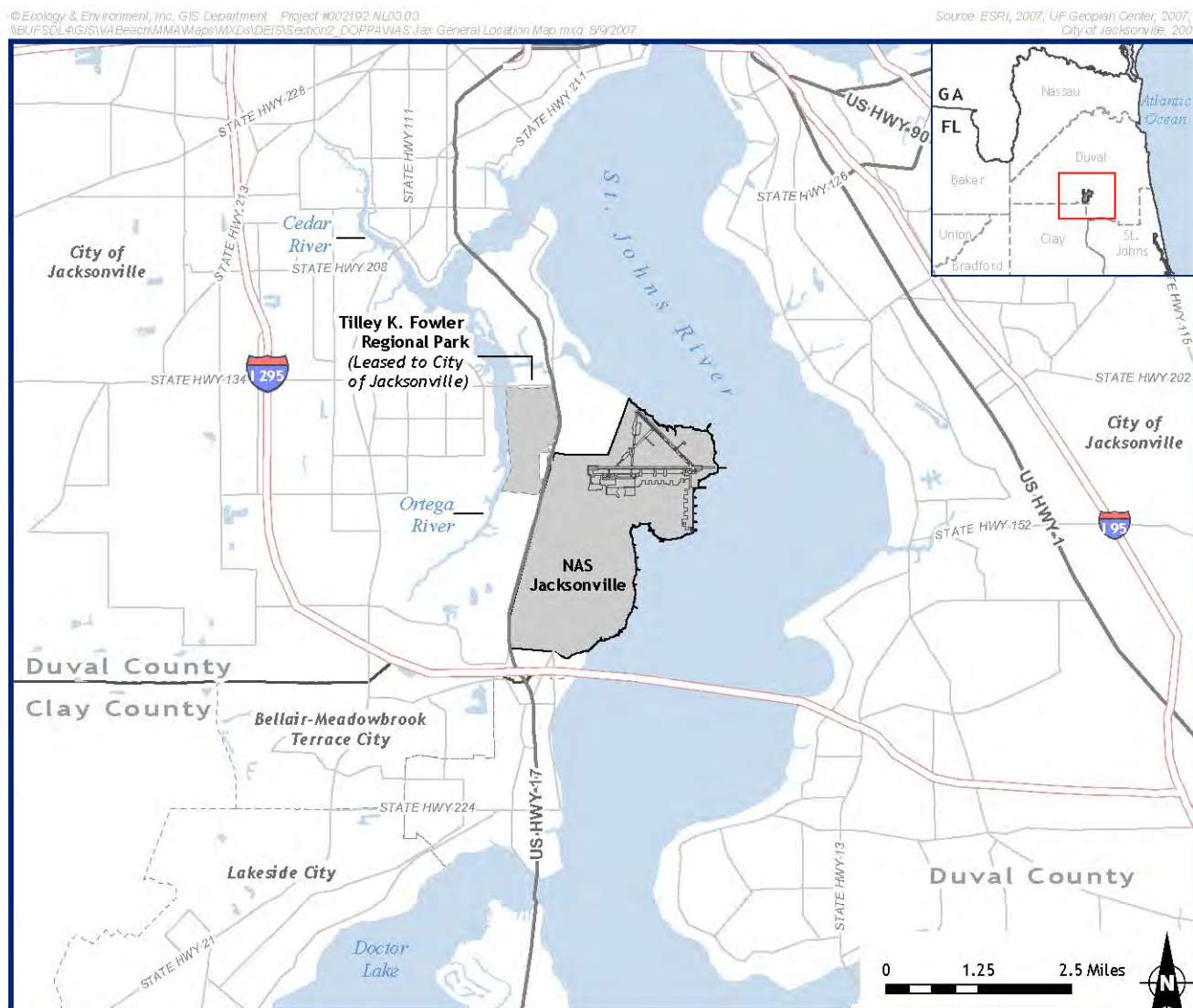
#### **NAS Jacksonville**

Commissioned on October 15, 1940, NAS Jacksonville occupies 3,896 acres in Jacksonville, Florida (Duval County) west of the St. Johns River and approximately 15 miles from the Atlantic Ocean (see Figure 2-1). Duval County lies along the northeast coast of Florida and is

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bordered by Nassau County to the north, Baker County to the west, Clay and St. Johns counties to the south, and the Atlantic Ocean to the east.



**Figure 2-1 General Location Map, NAS Jacksonville, Jacksonville, Florida**

NAS Jacksonville employs approximately 18,000 active duty and civilian personnel. It is a multi-mission base hosting more than 100 tenant commands. This installation serves as the host for the Commander Patrol and Reconnaissance Wing Eleven and Patrol Squadron 30 (VP-30) which is the FRS for the P-3C. NAS Jacksonville also hosts six fleet squadrons of P-3C aircraft, one P-3C Update<sup>1</sup> squadron, a detachment of the Helicopter Sea Combat Wing, Atlantic

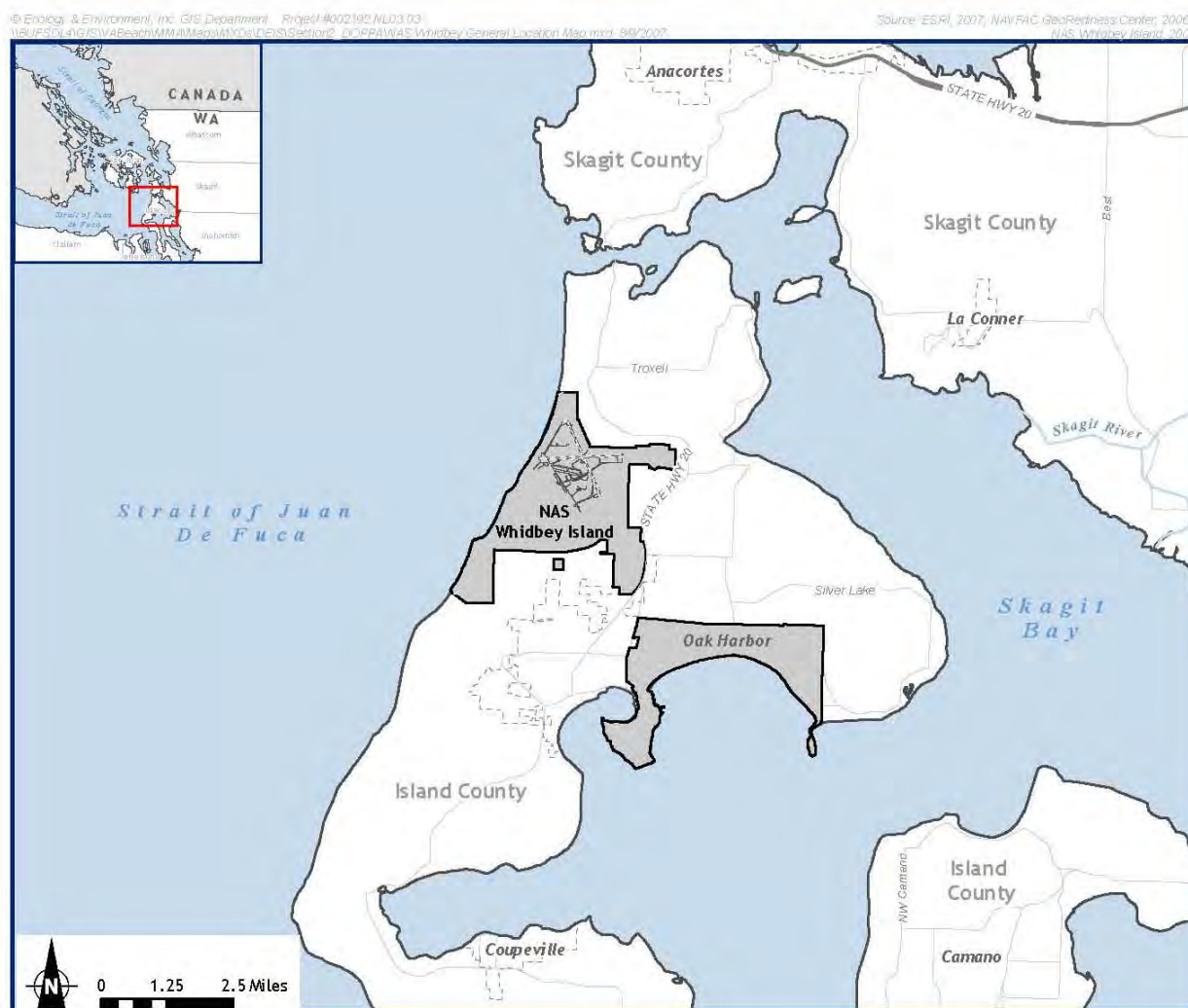
<sup>1</sup> The P-3C Update aircraft are not part of the P-8A MMA replacement action.



Fleet, and five squadrons of SH-60/HH-60/MH-60 helicopters. Additionally, an operational squadron of C-40 aircraft (the military cargo and passenger variant of the Boeing 737) operates from NAS Jacksonville. Towers Field contains the base's central airfield, with two runways. Runway 9/27 is 8,000 feet long and 200 feet wide, and Runway 14/32 is 5,977 feet long and 200 feet wide.

## **NAS Whidbey Island**

Commissioned on September 21, 1942, NAS Whidbey Island is 50 miles north of Seattle, Washington, next to the city of Oak Harbor in Island County (see Figure 2-2). Whidbey Island forms the northern boundary of Puget Sound and is located at the eastern end of the Strait of Juan de Fuca.



**Figure 2-2 General Location Map, NAS Whidbey Island, Whidbey Island, Washington**

NAS Whidbey Island includes two separate bases, Ault Field and Seaplane Base, and employs more than 9,000 military and civilian personnel. The air station is home to 18 active duty squadrons, two reserve squadrons, and numerous tenant commands. NAS Whidbey Island provides land-based support and training (including airspace, operating areas, and ranges) for all of the Navy's active duty EA-6B (being replaced by EA-18G) and two EP-3 aircraft squadrons and three P-3C squadrons. The station also supports a Navy Reserve P-3C and a C-9 squadron in addition to the air station's MH-60S search-and-rescue helicopters. Tenant commands include Commander Patrol and Reconnaissance Wing Ten and Commander Electronic Attack Wing Pacific. Ault Field contains the base's central airfield with two runways (14/32 and 07/25), both of which are 8,000 feet long and 200 feet wide.

### **MCBH Kaneohe Bay**

First commissioned as a Naval Air Station in 1941, MCBH Kaneohe Bay was re-commissioned on January 15, 1952, as a Marine Corps installation. MCBH Kaneohe Bay is located on Mokapu Peninsula, which connects to Oahu, on the windward side, near the communities of Kaneohe and Kailua (see Figure 2-3). The base is approximately 12 miles northeast of Honolulu. MCBH Kaneohe Bay employs approximately 11,200 active duty Navy, Marine Corps, and civilian personnel. MCBH Kaneohe Bay is one of several properties managed by Marine Corps Base Hawaii on Oahu, including Camp Smith, Kaneohe Bay, Marine Corps Training Area Bellows, the Pearl City Warehouse Annex, the Puuloa Range Complex, Manana Housing, and the Waikane Valley Impact Area.

The Marine Corps airfield has one runway 7,771 feet long and 200 feet wide. The installation is home to the 3rd Marine Regiment, Marine Aircraft Group 24, and the 3rd Radio Battalion. This installation supports three assigned squadrons of P-3C aircraft, one squadron of P-3C Update aircraft, one squadron of MH-60/SH-60 helicopters, two C-20 aircraft, and three squadrons of CH-53D aircraft. Tenant commands include Commander Patrol and Reconnaissance Wing Two.

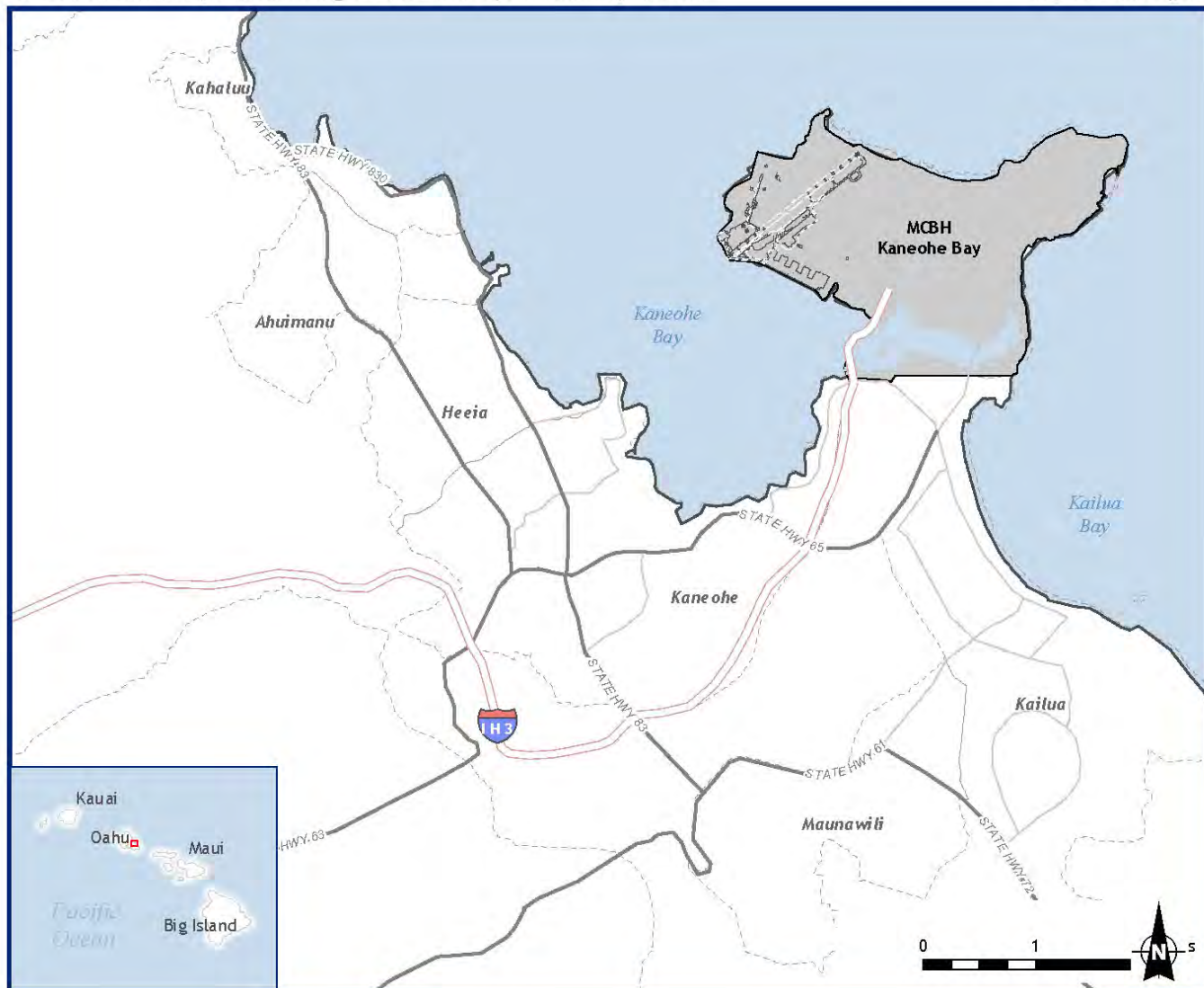


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Source: Environmental Systems Research Institute, Inc. (ESRI),  
2007, MCBH Kaneohe Bay, 2007



**Figure 2-3 General Location Map, MCBH Kaneohe Bay, Oahu, Hawaii**

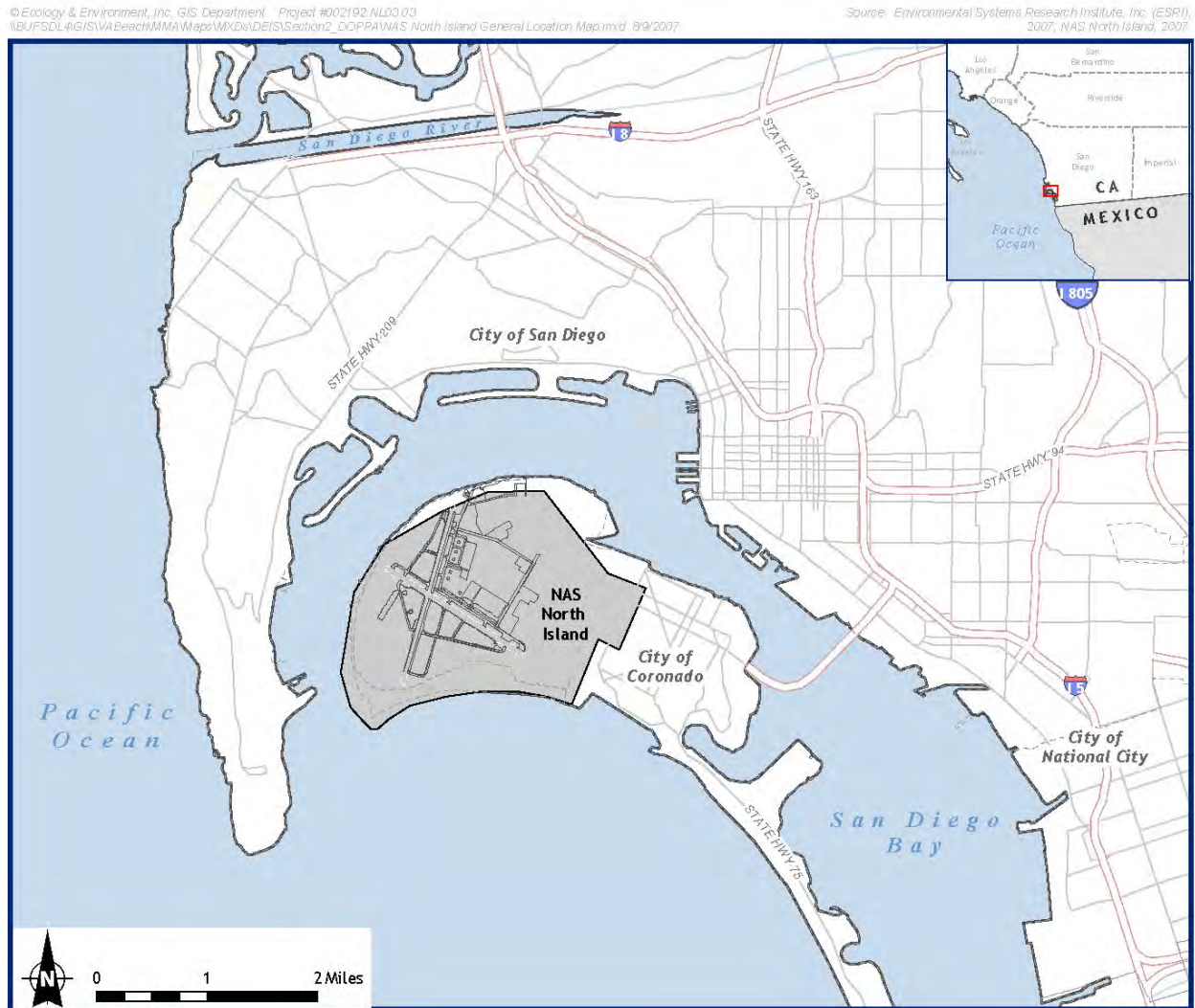
#### **NAS North Island**

North Island was commissioned as a Naval Air Station in 1917. Bordering the city of Coronado on Coronado Island in San Diego Bay and occupying 5,000 acres, it can homeport up to three Navy aircraft carriers (see Figure 2-4).

NAS North Island employs more than 21,000 active duty and reserve military and civilian personnel and is host to 16 squadrons and 80 additional tenant commands and activities. The base mission is to provide aviation support for the U.S. Pacific Fleet and other operating forces.

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NAS North Island has no assigned P-3C squadron; however, NAS North Island does host P-3C detachments for training at SOCAL ranges.



**Figure 2-4 General Location Map, NAS North Island, Coronado, California**

The airfield has more than 155 permanently assigned aircraft, including MH-60S Knight-hawks, SH-60B Seahawks, C-2A Greyhounds, several variants of the C-12, and C-40s. NAS North Island's Halsey Field incorporates two runways: Runway 18/36 is 8,000 feet long and 200 feet wide, and Runway 11/29 is 7,500 feet long and 300 feet wide.

## **2.2 Development of Alternatives**

Based on the purpose and need for the proposed action, as stated in Section 1 of this EIS, the following factors were considered in developing alternatives:

- Existing operational requirements would be supported by maintaining east and west continental U.S. P-3C maritime patrol homebase locations;
- Existing infrastructure at P-3C maritime patrol bases would be maximized and the need for new construction would be minimized;
- A presence in Hawaii would be maintained;
- Support of training in the SOCAL operating area would continue;
- A minimum of two squadrons would be located at each MOB;
- Asymmetric loading alternatives would place more fleet squadrons on the West Coast than the East Coast of the United States to support current strategic operational objectives;
- The FRS must be located at a continental U.S. MOB; and
- Split-siting of the FRS (i.e., the FRS aircraft would be split between two or more bases) would not be considered because of the inefficiencies (duplication of training, facilities, equipment, and instructors) associated with split-siting.

## **2.3 Infrastructure Requirements**

Homebase installations need adequate space and capacity to accommodate associated support facilities, personnel, and functions of the P-8A MMA. The fleet squadrons and FRS would be maintained by contract support and overseen by the Patrol Wings. Facility components necessary to accommodate the P-8A MMA differ for each alternative and would be tailored to meet necessary facility requirements for operational support, training, maintenance, supply, personnel support, and utilities. A description of each type of facility required to homebase the P-8A MMA squadrons is provided below.

### **2.3.1 Training Facilities**

Training facilities would include an Integrated Training Center (ITC) or a Fleet Training Center (FTC) to house aircraft simulators and classrooms. The complexity of the P-8A MMA system makes it vital that sophisticated aircraft and weapons system simulators be available for use by the FRS and fleet squadrons. Simulators minimize training costs by substituting for actual flight hours and enhance safety by allowing personnel to practice emergency procedures without putting the pilot and aircraft at risk.

- **Integrated Training Center** (i.e., training facilities supporting both FRS and operational fleet squadron training). Training facilities dedicated at the FRS site location include operational flight, tactical flight, weapons tactics, avionics, weapons loading, and task trainers for each of the crew stations. Training facilities would include space

for classrooms, training devices, tools, computer stations, network communications equipment, study rooms, instructor offices, management and briefing areas, and maintenance areas. Initial training facilities need to be operational in 2012 to train the very first complement of crew members and support personnel for the first transitioned squadrons and are sized to accommodate fleet training requirements at the ITC location. These same facilities would then be used to train subsequent replacement squadrons.

- **Fleet Training Center** (i.e., training facilities supporting operational fleet squadron training only). Operational squadrons require a separate training system from the FRS dedicated to mission readiness. Operational and FRS training can be co-located, although extra space would be required to accommodate the increase in the number of required trainers and infrastructure. The training facilities for the fleet would be similar to those needed by the FRS.

### **2.3.2 Hangar**

A hangar contains a high bay area used for aircraft maintenance in a controlled environment. The P-8A MMA requires a modified Type II hangar, which provides high bay space for land-based fixed-wing aircraft, crew member and equipment space, and storage and administrative space.

### **2.3.3 Aircraft Parking Apron**

Aircraft parking aprons consist of paved areas close to maintenance hangars to provide parking spaces, tie-down points, line maintenance, loading, unloading, and aircraft servicing. The area requirements are based on the type and number of aircraft to be parked.

### **2.3.4 Aircraft Washrack**

Aircraft washracks and rinse facilities are used at air installations to clean the aircraft in conjunction with periodic maintenance. Washracks are used for rinsing salt off aircraft after low-level flights over water and during periodic maintenance.

### **2.3.5 Combat Aircraft Ordnance Loading Area**

The combat aircraft ordnance loading area is an apron where weapons are loaded and off-loaded from combat aircraft departing and/or returning from weapons training flights. Weapons handled in this area are not armed.

Ordnance, explosive, and inert-item storage is provided for mission-essential P-8A MMA consumable items. Explosive items would generally be stored in the installation's magazine area, while inert items (e.g., sonobuoys) would be stored in warehouse-like structures.

#### **2.3.6 Aircraft-Ready Fuel Storage/Aircraft Defueling Facility**

Aircraft-ready fuel tanks are needed to provide an operating and reserve supply of jet fuel. The aircraft defueling facility is used to assist in aircraft maintenance and defueling operations. A designated defueling truck is used to provide these services.

#### **2.3.7 Maintenance and Supply Facilities**

As previously mentioned, the P-8A MMA is a military derivative of the Boeing 737 commercial aircraft, and maintenance support would be provided by contractor logistics support teams. The teams would provide basic maintenance, preventive maintenance, inspections, servicing/replacement of various aircraft components, and specialized repair of inoperative components. These facilities would consist of maintenance shops, tool rooms, stock rooms, equipment storage, and warehouse spaces.

#### **2.3.8 Tactical Support Center**

In support of the maritime patrol mission, the TSC processes real-time data from the maritime patrol aircraft and provides the operating commander with the ability to interface, direct, and support maritime patrol assets and provides the command, control, communications, computers, and intelligence data center for the operating Naval forces. The TSC provides warfare campaign and mission-planning capabilities, tactical aircrew briefing and debriefing, real-time tactical direction and coordination, first-level sensor and tactical data analysis, and post-mission data analysis. The TSC also would support the command and control functions of the Broad Area Maritime Surveillance unmanned aircraft system.

#### **2.3.9 Manpower and Personnel Support**

In addition to facilities directly related to the MMA mission, a variety of other facilities are needed to support Navy personnel and their families. These include but are not limited to military family housing, bachelor quarters, personnel support detachments (pay and records administration), gyms, commissaries, child development centers, and medical facilities.

## **2.4 Homebasing Alternatives**

The homebasing alternatives maximize the use of existing infrastructure at the maritime patrol bases. The alternatives differ in:

- The location of the FRS;
- The method of maintaining a maritime patrol presence in Hawaii; and
- The number of squadrons to be stationed at each MOB.

As discussed previously, the FRS is the schoolhouse and provides the professional maritime patrol center of excellence for both aircrew and enlisted maintenance personnel. Co-locating the FRS with the fleet squadrons provides immediate and daily access to the full resources of the aircraft community: senior leadership, guidance, and policies; tactical development; weapons schools; routine submarine target availability; and overall fleet experience. New aviators leave the FRS and report to their fleet squadrons with a core knowledge of local air station course rules, weapon ranges, and target procedures—all of which provide an increased margin of safety as the replacement fleet aviators refine newly learned warfare skills. The two locations under consideration for homebasing the FRS are NAS Jacksonville, Florida, and NAS Whidbey Island, Washington.

There are three methods of implementing a maritime patrol presence mission in Hawaii: (1) homebase three fleet squadrons; (2) homebase two fleet squadrons; and (3) rotate maritime patrol detachments from continental U.S. homebases. All three methods address Hawaii maritime homeland defense requirements.

In Hawaii, MCBH Kaneohe Bay is being considered for providing support for the maritime patrol mission. MCBH Kaneohe Bay currently supports the maritime patrol mission and has existing infrastructure. It provides 7,771 feet of runway (shorter than the suggested 8,000-foot runway length for extreme operational conditions; however, aircraft loads can be managed to decrease the required runway length for take-off and still meet mission requirements).

Six siting alternatives have been developed with respect to the guidelines presented in Section 1.2, Purpose and Need, and Section 2.2, Development of Alternatives. As previously discussed, baseline data for each alternative siting location from the year 2011 have been used to describe the affected environment to account for aircraft and personnel changes that would occur before the P-8A MMA is introduced. Alternative 1 would maintain the current maritime patrol

force geographic disposition at existing maritime patrol bases. Alternatives 2 through 6 represent various options for overall maritime patrol force disposition. Under the No Action Alternative, the Navy would maintain existing P-3C aircraft operating at NAS Jacksonville, Florida; NAS Whidbey Island, Washington; and MCBH Kaneohe Bay, Hawaii, with a detachment at NAS North Island, California.

Table 2-3 summarizes the six siting alternatives considered for basing the P-8A MMA. Table 2-4 indicates the P-8A MMA personnel loadings under all alternatives and the change in personnel loading from the P-3C to the P-8 MMA at each base. A summary of the 2011 baseline data compiled for aircraft and personnel loadings for each base is provided in the following subsections. Table 2-5 provides the total base personnel end state, inclusive of changes proposed with the P-3C replacement, for each installation under the various siting alternatives. Table 2-5 also illustrates the change in total base personnel loadings from 2011, the baseline year, to 2019, the end year for this proposed action.

#### **2.4.1 NAS Jacksonville**

Under Alternatives 1 through 6, NAS Jacksonville would homebase five or six fleet squadrons for a total of 30 to 48 P-8A MMA. Alternatives 1, 2, 3, and 5 would include co-locating the FRS at NAS Jacksonville. All siting alternatives would result in a decrease in personnel with respect to existing P-3C loading at NAS Jacksonville. The decrease would range from (-)1,822 (under Alternative 1 with six squadrons and the FRS) to (-)2,338 (under Alternatives 4 and 6 with five squadrons and no FRS).

**Table 2-3 Multi-Mission Maritime Aircraft Siting Alternatives Summary Table**

<b>Alternatives</b>	<b>Siting Locations</b>			
	<b>NAS Jacksonville</b>	<b>NAS Whidbey Island</b>	<b>NAS North Island</b>	<b>MCBH Kaneohe Bay</b>
Alternative 1	6 Fleet Squadrons and FRS	3 Fleet Squadrons	Periodic Squadron Detachments	3 Fleet Squadrons
Alternative 2	5 Fleet Squadrons and FRS	7 Fleet Squadrons	Periodic Squadron Detachments	Permanent Squadron Detachment
Alternative 3	5 Fleet Squadrons and FRS	5 Fleet Squadrons	Periodic Squadron Detachments	2 Fleet Squadrons
Alternative 4	5 Fleet Squadrons	5 Fleet Squadrons and FRS	Periodic Squadron Detachments	2 Fleet Squadrons
Alternative 5 (Preferred Alternative)	5 Fleet Squadrons and FRS	4 Fleet Squadrons	Periodic Squadron Detachments	3 Fleet Squadrons
Alternative 6	5 Fleet Squadrons	4 Fleet Squadrons and FRS	Periodic Squadron Detachment	3 Fleet Squadrons



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**Table 2-4 Projected P-8A MMA Personnel Loadings for All Installations**

	<b>Alternative 1</b>	<b>Alternative 2</b>	<b>Alternative 3</b>	<b>Alternative 4</b>	<b>Alternative 5 Preferred Alternative</b>	<b>Alternative 6</b>	<b>No Action Alternative</b>
<b>NAS Jacksonville</b>	<b>Existing P-3C: 6 Squadrons with FRS; 3,814 Personnel (includes AIMD personnel)</b>						
P-8A MMA Squadrons	6 Fleet Squadrons and FRS	5 Fleet Squadrons and FRS	5 Fleet Squadrons and FRS	5 Fleet Squadrons	5 Fleet Squadrons and FRS	5 Fleet Squadrons	<b>0</b>
Total Personnel P-8A MMA	<b>1,992</b>	<b>1,785</b>	<b>1,785</b>	<b>1,476</b>	<b>1,785</b>	<b>1,476</b>	<b>0</b>
Potential Change from P-3C	<b>(-)1,822</b>	<b>(-)2,029</b>	<b>(-)2,029</b>	<b>(-)2,338</b>	<b>(-)2,029</b>	<b>(-)2,338</b>	<b>0</b>
<b>NAS Whidbey Island</b>	<b>Existing P-3C: 3 Squadrons; 1,512 Personnel (includes AIMD personnel)</b>						
P-8A MMA Squadrons	3 Fleet Squadrons	7 Fleet Squadrons	5 Fleet Squadrons	5 Fleet Squadrons and FRS	4 Fleet Squadrons	4 Fleet Squadrons and FRS	<b>0</b>
Total Personnel P-8A MMA	<b>904</b>	<b>1,883</b>	<b>1,476</b>	<b>1,785</b>	<b>1,194</b>	<b>1,503</b>	<b>0</b>
Potential Change from P-3C	<b>(-)608</b>	<b>(+)371</b>	<b>(-)36</b>	<b>(+)273</b>	<b>(-)318</b>	<b>(-)9</b>	<b>0</b>
<b>NAS North Island</b>	<b>Existing P-3C: Periodic Squadron Detachments; 150 Personnel</b>						
P-8A MMA Squadrons	Periodic Squadron Detachments	Periodic Squadron Detachments	Periodic Squadron Detachments	Periodic Squadron Detachments	Periodic Squadron Detachments	Periodic Squadron Detachments	<b>0</b>
Total Personnel P-8A MMA	<b>167</b>	<b>167</b>	<b>167</b>	<b>167</b>	<b>167</b>	<b>167</b>	<b>0</b>
Potential Change from P-3C	<b>(+)17</b>	<b>(+)17</b>	<b>(+)17</b>	<b>(+)17</b>	<b>(+)17</b>	<b>(+)17</b>	<b>0</b>
<b>MCBH Kaneohe Bay</b>	<b>Existing P-3C: 3 Squadrons; 1,641 Personnel (includes AIMD personnel)</b>						
P-8A MMA Squadrons	3 Fleet Squadrons	Permanent Squadron Detachment	2 Fleet Squadrons	2 Fleet Squadrons	3 Fleet Squadrons	3 Fleet Squadrons	<b>0</b>
Total Personnel P-8A MMA	<b>904</b>	<b>47</b>	<b>639</b>	<b>639</b>	<b>904</b>	<b>904</b>	<b>0</b>
Potential Change from P-3C	<b>(-)737</b>	<b>(-)1,594</b>	<b>(-)1,002</b>	<b>(-)1,002</b>	<b>(-)737</b>	<b>(-)737</b>	<b>0</b>

Key:

AIMD = Aircraft Intermediate Maintenance Department.



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**Table 2-5 Projected Total Personnel Loadings for All Installations (Total End State [2019])**

	<b>Alternative 1</b>	<b>Alternative 2</b>	<b>Alternative 3</b>	<b>Alternative 4</b>	<b>Alternative 5 Preferred Alternative</b>	<b>Alternative 6</b>	<b>No Action Alternative</b>
<b>NAS Jacksonville</b>	<b>Total Base Loading (2011): 17,521 Personnel</b>						
P-8A MMA Squadrons	6 Fleet Squadrons and FRS	5 Fleet Squadrons and FRS	5 Fleet Squadrons and FRS	5 Fleet Squadrons	5 Fleet Squadrons and FRS	5 Fleet Squadrons	<b>0</b>
Total 2019 Base Loading	<b>15,235</b>	<b>15,028</b>	<b>15,028</b>	<b>14,719</b>	<b>15,028</b>	<b>14,719</b>	<b>0</b>
Potential Change from 2011 to 2019	<b>(-)2,286</b>	<b>(-)2,493</b>	<b>(-)2,493</b>	<b>(-)2,802</b>	<b>(-)2,493</b>	<b>(-)2,802</b>	<b>0</b>
<b>NAS Whidbey Island</b>	<b>Total Base Loading (2011): 9,033 Personnel</b>						
P-8A MMA Squadrons	3 Fleet Squadrons	7 Fleet Squadrons	5 Fleet Squadrons	5 Fleet Squadrons and FRS	4 Fleet Squadrons	4 Fleet Squadrons and FRS	<b>0</b>
Total 2019 Base Loading	<b>8,159</b>	<b>9,138</b>	<b>8,731</b>	<b>9,040</b>	<b>8,449</b>	<b>8,758</b>	<b>0</b>
Potential Change from 2011 to 2019	<b>(-)874</b>	<b>(+)105</b>	<b>(-)302</b>	<b>(+)7</b>	<b>(-)584</b>	<b>(-)275</b>	<b>0</b>
<b>NAS North Island</b>	<b>Total Base Loading (2011): 21,487 Personnel</b>						
P-8A MMA Squadrons	Periodic Squadron Detachments	Periodic Squadron Detachments	Periodic Squadron Detachments	Periodic Squadron Detachments	Periodic Squadron Detachments	Periodic Squadron Detachments	<b>0</b>
Total 2019 Base Loading	<b>21,375</b>	<b>21,375</b>	<b>21,375</b>	<b>21,375</b>	<b>21,375</b>	<b>21,375</b>	<b>0</b>
Potential Change from 2011 to 2019	<b>(-)112</b>	<b>(-)112</b>	<b>(-)112</b>	<b>(-)112</b>	<b>(-)112</b>	<b>(-)112</b>	<b>0</b>
<b>MCBH Kaneohe Bay</b>	<b>Total Base Loading (2011): 11,177 Personnel</b>						
P-8A MMA Squadrons	3 Fleet Squadrons	Permanent Squadron Detachment	2 Fleet Squadrons	2 Fleet Squadrons	3 Fleet Squadrons	3 Fleet Squadrons	<b>0</b>
Total 2019 Base Loading	<b>10,429</b>	<b>10,572</b>	<b>10,164</b>	<b>10,164</b>	<b>10,429</b>	<b>10,429</b>	<b>0</b>
Potential Change from 2011 to 2019	<b>(-)748</b>	<b>(-)1,605</b>	<b>(-)1,013</b>	<b>(-)1,013</b>	<b>(-)748</b>	<b>(-)748</b>	<b>0</b>

#### **2.4.2 NAS Whidbey Island**

Alternatives 1 through 6 would homebase three, four, five, or seven fleet squadrons at NAS Whidbey Island, for a total of 18 to 42 P-8A MMA. Alternatives 4 and 6 include co-locating the FRS at NAS Whidbey Island. Alternatives 1, 3, 5, and 6 would result in a decrease in personnel with respect to baseline P-3C loadings at NAS Whidbey Island. The decrease would range from (-)9 (under Alternative 6 with four squadrons and the FRS) to (-)608 (under Alternative 1 with three squadrons). Alternatives 2 and 4 would result in an increase in personnel with respect to existing P-3C loadings at NAS Whidbey Island. The increase would range from (+)273 (under Alternative 4 with five fleet squadrons and the FRS) to (+)371 (under Alternative 2 with seven fleet squadrons).

#### **2.4.3 NAS North Island**

Alternatives 1 through 6 include temporary detachment operations at NAS North Island to support training in SOCAL operating areas. All siting alternatives would result in an increase of 17 personnel compared with the existing P-3C personnel half-year loadings at NAS North Island.

#### **2.4.4 MCBH Kaneohe Bay**

Alternatives 1 through 6, excluding Alternative 2, would homebase two to three fleet squadrons at MCBH Kaneohe Bay, for a total of 12 to 18 P-8A MMA. Alternative 2 would site a permanent squadron detachment at MCBH Kaneohe Bay that would include two aircraft and four crews. All siting alternatives would result in a decrease in Navy personnel with respect to the existing P-3C loadings at MCBH Kaneohe Bay. The decrease would range from (-)737 (under Alternatives 1, 5, and 6 with three squadrons) to (-)1,542 (under Alternative 2 with only a permanent squadron detachment).

### **2.5 Infrastructure Assessment**

The Navy conducted facility assessments at each of the four installations and determined the new construction or renovation needed and potential site locations at each alternative homebase. The evaluation focused on existing use, condition, and capacity of support facilities at each base to accommodate the P-8A MMA.

A new training facility requirement is common to all P-8A MMA homebasing sites. Depending on the alternative, a variety of facilities would need to be constructed or renovated at each base to provide requisite space and infrastructure. Appendix D provides more detailed information on facility requirements for each alternative and describes new construction, renovations to existing facilities to accommodate the new P-8A MMA program, utility upgrades, and any demolition projects. Table 2-6 summarizes facility renovation square footage, new construction area acreage, new impervious surface acreage, total construction costs, and facility lifecycle costs associated with the P-8A MMA program at each installation for each alternative. Provided below are summary descriptions of construction requirements and site locations for each base.

### **2.5.1 NAS Jacksonville**

Figures 2-5 and 2-6 show the locations of all required facilities at NAS Jacksonville. Under Alternatives 1 through 6, the P-8A MMA would be accommodated by the existing six-bay P-3C hangar located north of Yorktown Avenue. Enough space currently exists to park 48 P-8A MMAs on the parking apron next to the hangar.

New construction at NAS Jacksonville to support the P-8A MMA would include new training facilities and the associated parking area, which would be constructed on a vacant site between Yorktown Avenue and Saratoga Avenue. The size of the training facility would range from 93,566 square feet (Alternatives 4 and 6) to 165,665 square feet (Alternatives 1, 2, 3, and 5). Once constructed, the new training facilities and parking area would add up to 6 acres of new impervious surface at the installation.

### **2.5.2 NAS Whidbey Island**

Primary facilities that would have to be constructed at NAS Whidbey Island to support the P-8A MMA include a new aircraft hangar, aircraft parking apron expansion, training facilities, an expansion of the TSC, an operational storage facility, ordnance storage, and a parking area for privately owned vehicles (POVs). Alternatives 2, 3, 4, and 6 would place the new hangar, expanded apron, contractor logistics support, and the TSC with associated POV parking at the southeast end of the flight line, east of Charles Porter Avenue (see Figures 2-7, 2-8, and 2-9). Under Alternatives 1 and 5, the new hangar, contractor logistics support, the TSC, and associated POV parking also would be sited east of Charles Porter Avenue; however, Alternatives 1 and 5

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**Table 2-6 Facility Summary for All Installations**

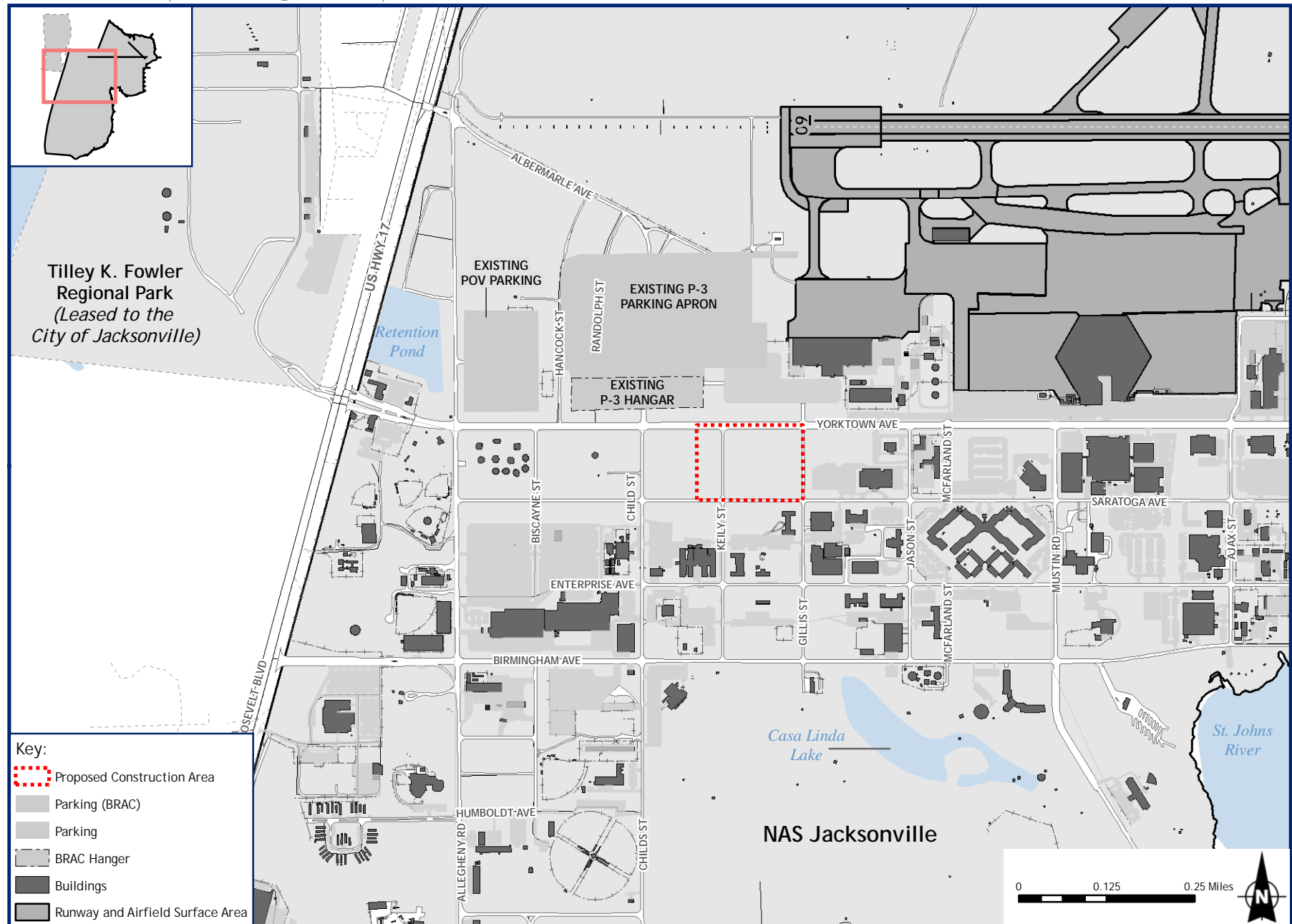
	<b>Alternative 1</b>	<b>Alternative 2</b>	<b>Alternative 3</b>	<b>Alternative 4</b>	<b>Alternative 5 Preferred Alternative</b>	<b>Alternative 6</b>	<b>No Action Alternative</b>
<b>NAS Jacksonville</b>							
P-8A MMA Squadrons	6 Fleet Squadrons and FRS	5 Fleet Squadrons and FRS	5 Fleet Squadrons and FRS	5 Fleet Squadrons	5 Fleet Squadrons and FRS	5 Fleet Squadrons	0
Facility Renovation (square feet)	80, 400	80, 400	80, 400	78, 000	80, 400	78, 000	0
New Construction Area (acres)	6.0	6.0	6.0	4.5	6.0	4.5	0
New Impervious Surface (acres)	6.0	6.0	6.0	4.5	6.0	4.5	0
<b>Total Construction Costs</b>	<b>\$53,317,972</b>	<b>\$53,317,972</b>	<b>\$53,317,972</b>	<b>\$36,657,677</b>	<b>\$53,317,972</b>	<b>\$36,657,677</b>	<b>0</b>
<b>NAS Whidbey Island</b>							
P-8A MMA Squadrons	3 Fleet Squadrons	7 Fleet Squadrons	5 Fleet Squadrons	5 Fleet Squadrons and FRS	4 Fleet Squadrons	4 Fleet Squadrons and FRS	0
Facility Renovation (square feet)	0	0	0	0	0	0	0
New Construction Area (acres)	12.00	44.71	23.97	44.92	12.64	34.08	0
New Impervious Surface (acres)	5.6	32.6	11.8	32.5	5.6	21.6	0
<b>Total Construction Costs</b>	<b>\$108,468,636</b>	<b>\$243,124,984</b>	<b>\$177,944,539</b>	<b>\$258,791,246</b>	<b>\$130,199,137</b>	<b>\$223,779,934</b>	<b>0</b>
<b>NAS North Island</b>							
P-8A MMA Squadrons	Periodic Squadron Detachments	Periodic Squadron Detachments	Periodic Squadron Detachments	Periodic Squadron Detachments	Periodic Squadron Detachments	Periodic Squadron Detachments	0
Facility Renovation (square feet)	0	0	0	0	0	0	0
New Construction Area (acres)	0	0	0	0	0	0	0
New Impervious Surface (acres)	0	0	0	0	0	0	0
<b>Total Construction Costs</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>0</b>

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**Table 2-6 Facility Summary for All Installations (continued)**

	<b>Alternative 1</b>	<b>Alternative 2</b>	<b>Alternative 3</b>	<b>Alternative 4</b>	<b>Alternative 5 Preferred Alternative</b>	<b>Alternative 6</b>	<b>No Action Alternative</b>
<b>MCBH Kaneohe Bay</b>							
P-8A MMA Squadrons	3 Fleet Squadrons	Permanent Squadron Detachment	2 Fleet Squadrons	2 Fleet Squadrons	3 Fleet Squadrons	3 Fleet Squadrons	0
Facility Renovation (square feet)	33, 160	0	33, 160	33, 160	33, 160	33, 160	0
New Construction Area (acres)	6.1	3.0	6.1	6.1	6.1	6.1	0
New Impervious Surface (acres)	4.1	0	4.0	4.0	4.1	4.1	0
<b>Total Construction Costs</b>	<b>\$147,457,305</b>	<b>\$4,926,840</b>	<b>\$136,423,401</b>	<b>\$136,423,401</b>	<b>\$147,457,305</b>	<b>\$147,457,305</b>	<b>0</b>
<b>P-8A MMA Lifecycle Costs</b>							
<b>Net Present Value</b>	<b>\$195,360,131</b>	<b>\$78,133,654</b>	<b>\$359,768,540</b>	<b>\$416,522,005</b>	<b>\$251,861,729</b>	<b>\$376,743,262</b>	<b>0</b>

Note: Total construction costs include all project costs associated with readying the installation for the P-8A MMA replacement action. These costs can include new facility construction, renovation, and/or reconfiguration of existing facilities, mitigation actions, and remediation procedures. The construction costs vary between each installation and under different alternatives based on an installation's unique set of needs and on the number of aircraft proposed under each alternative.



**Figure 2-5**  
 Proposed Construction Area - NAS Jacksonville  
 Jacksonville, Florida

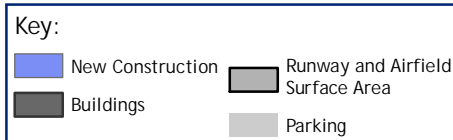
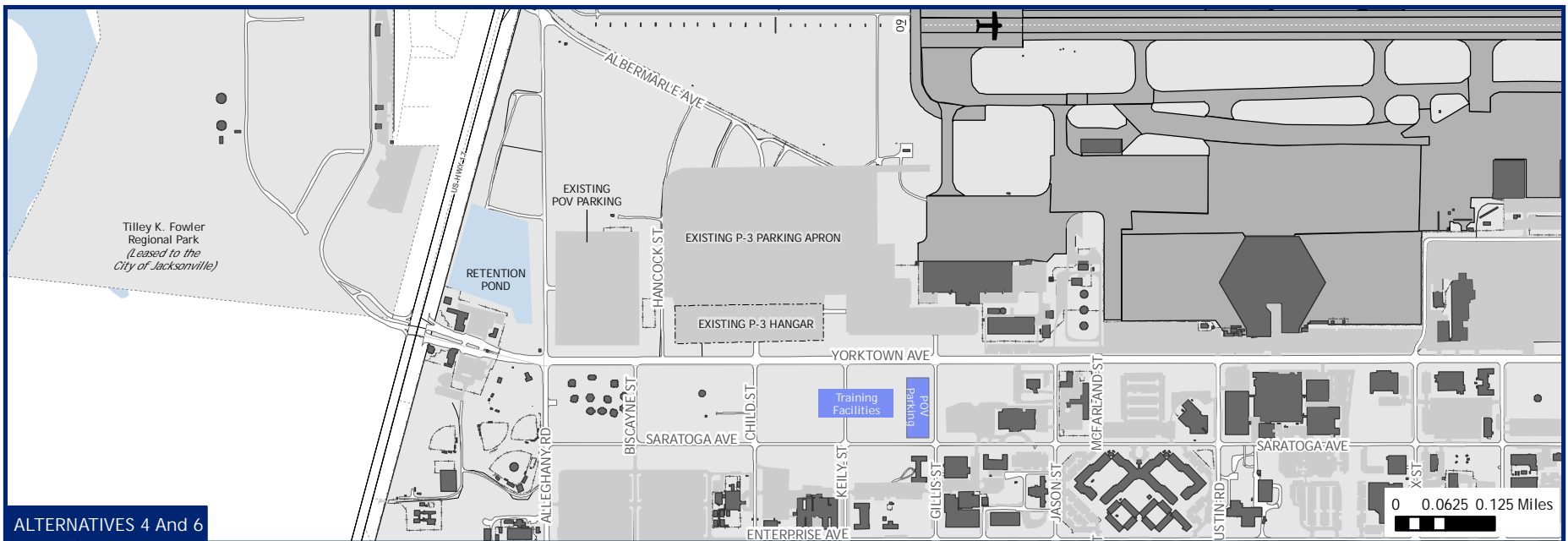
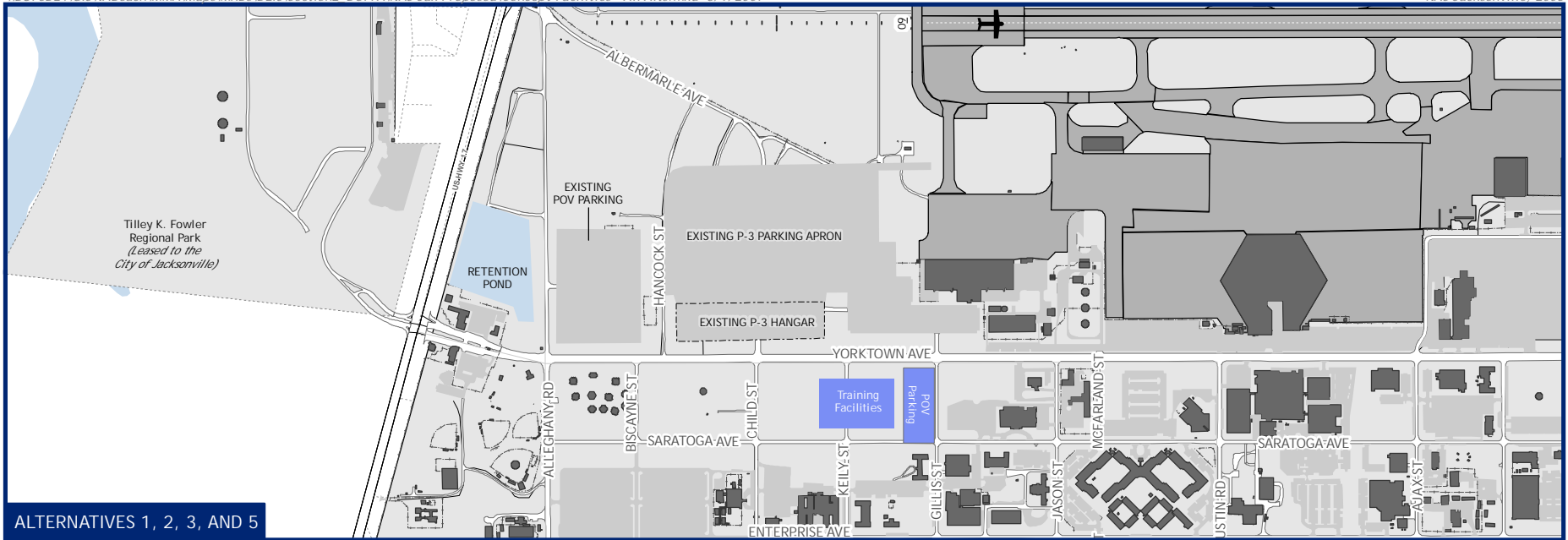


Figure 2-6  
 Conceptual Layout of Planned Facilities Per Alternative  
 NAS Jacksonville, Jacksonville, Florida



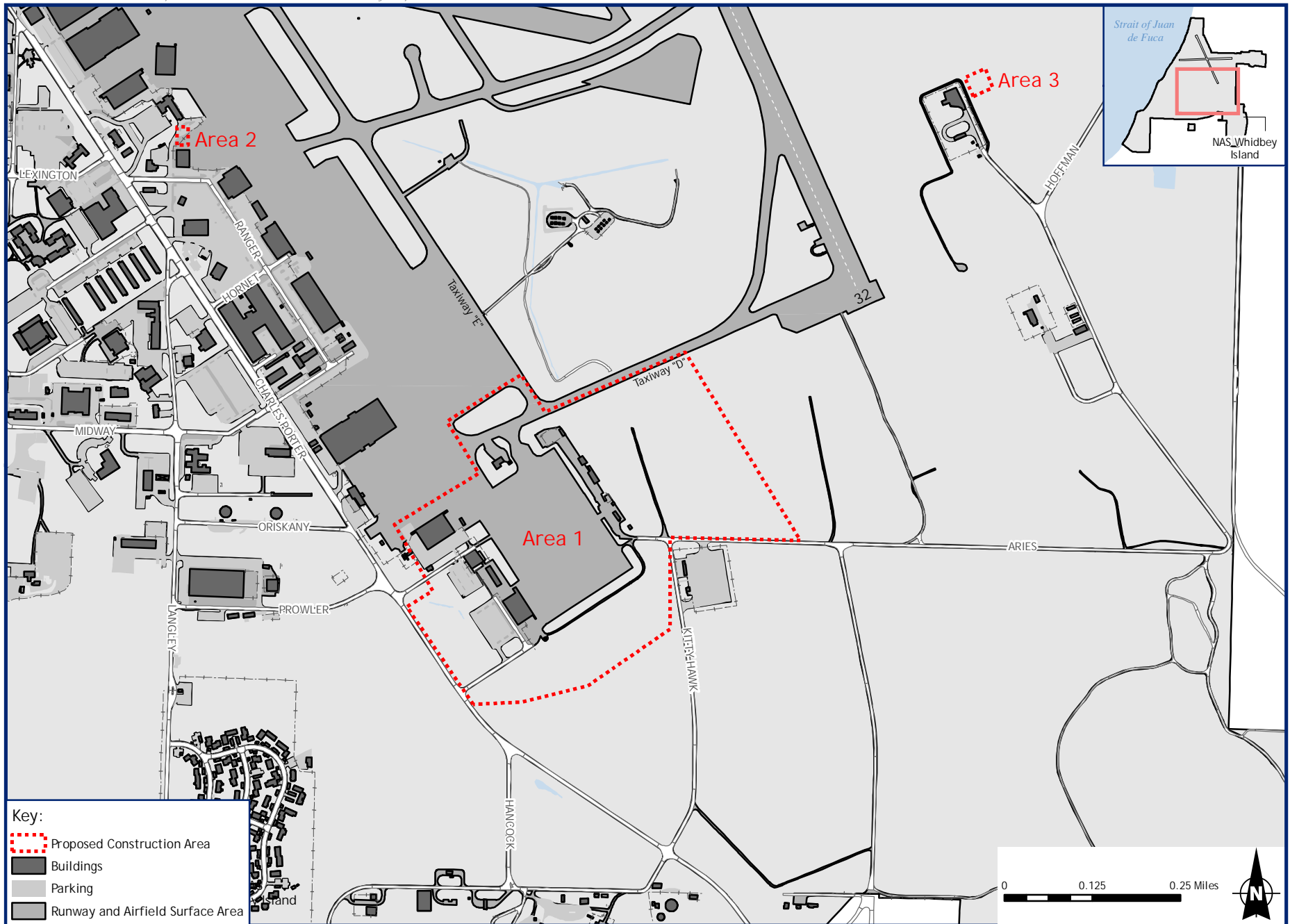


Figure 2-7  
 Proposed Construction Areas - NAS Whidbey Island  
 Whidbey Island, Washington



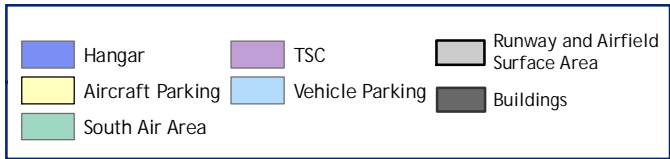
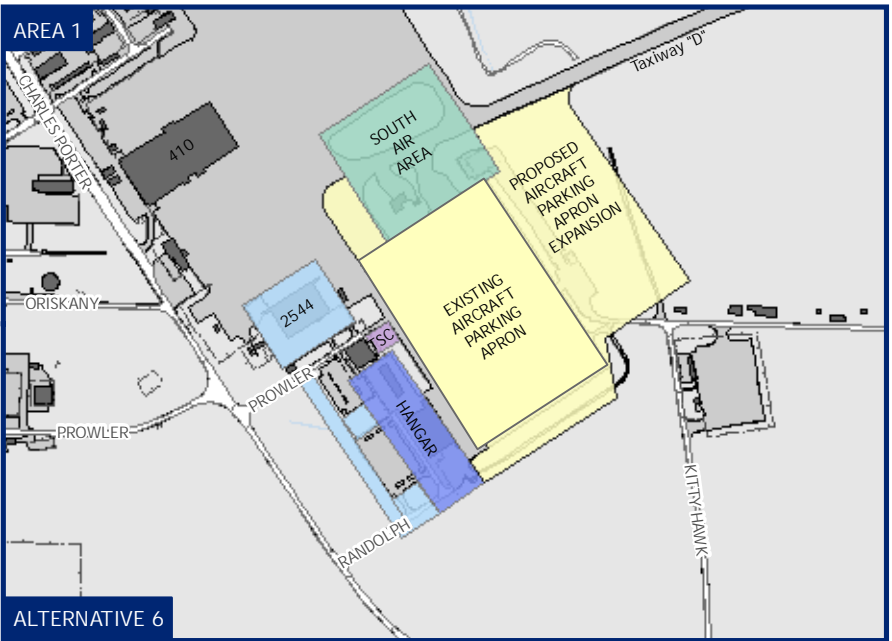
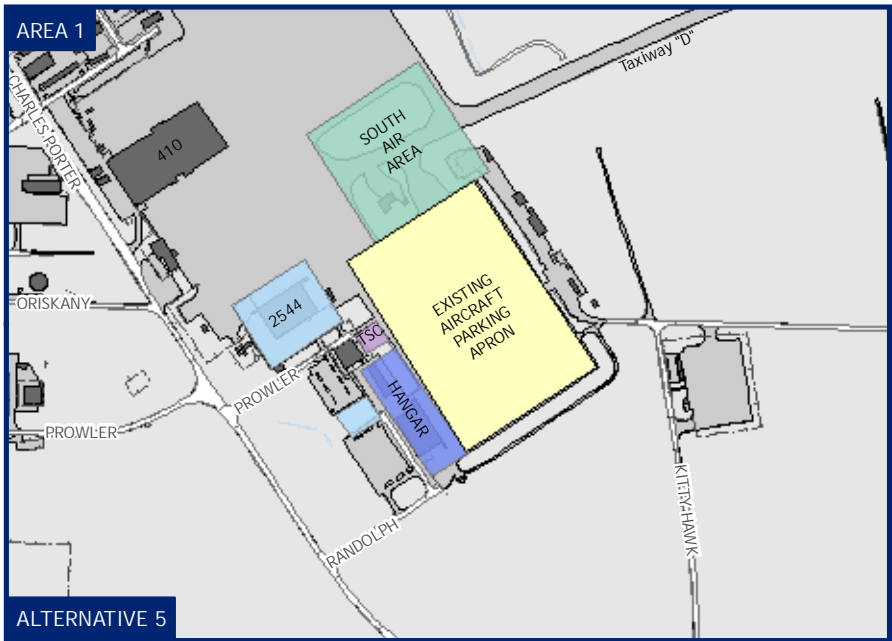
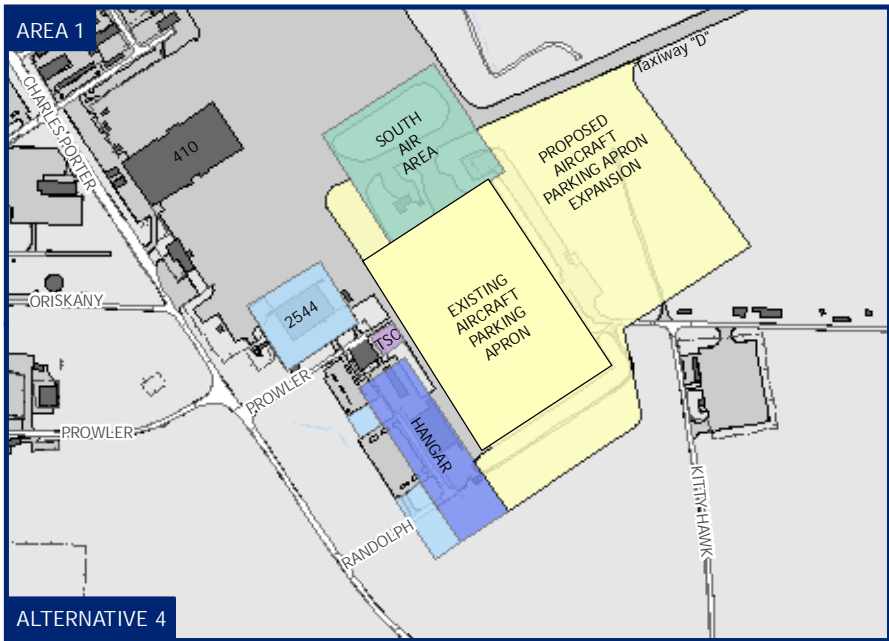
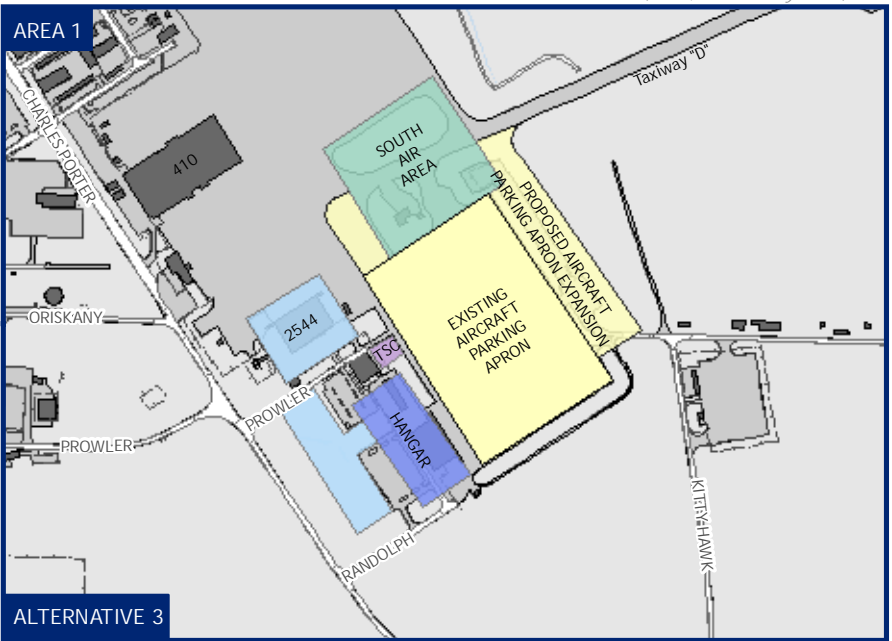
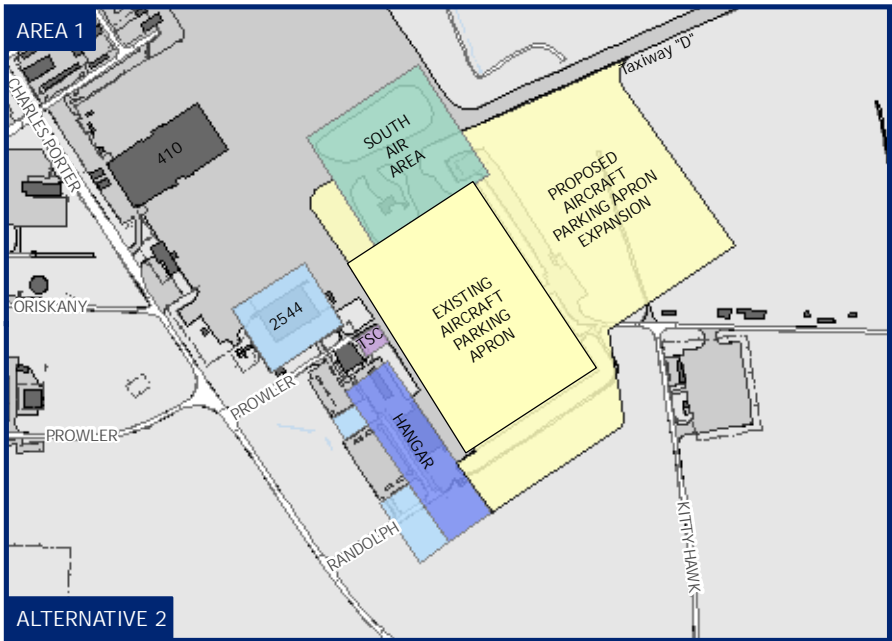
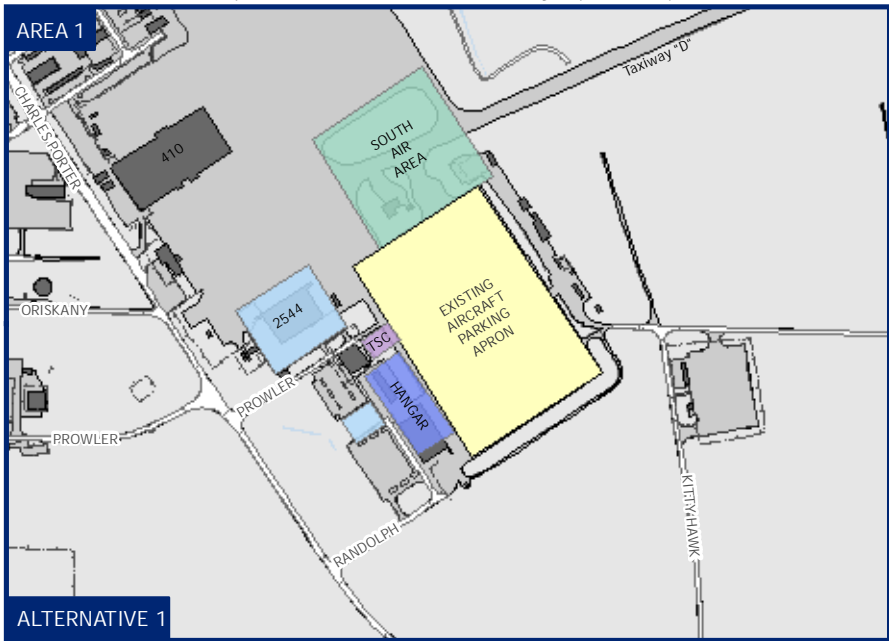


Figure 2-8  
Conceptual Layout of Planned Facilities Per Alternative  
NAS Whidbey Island, Whidbey Island, Washington



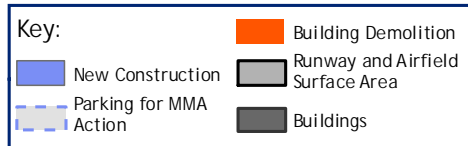
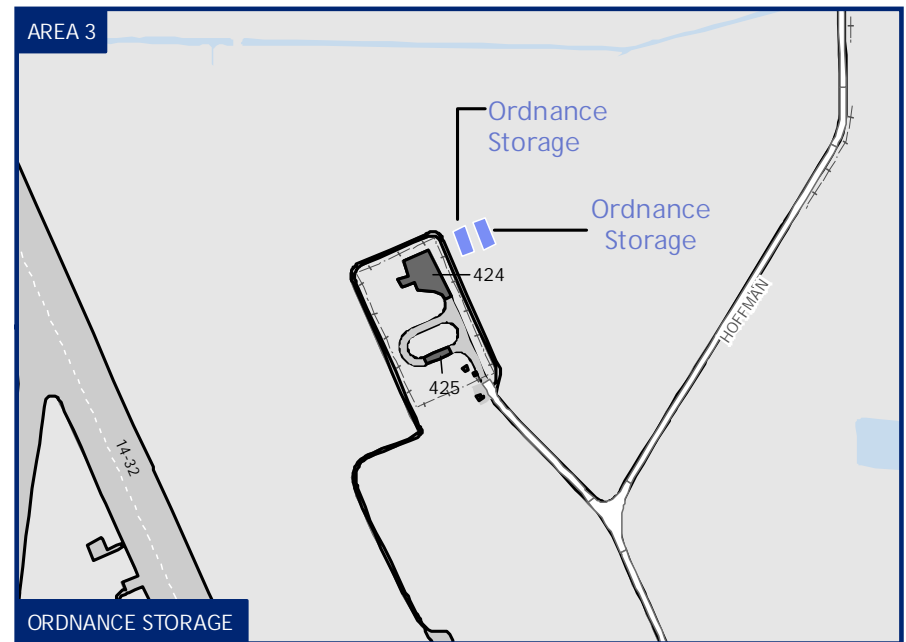
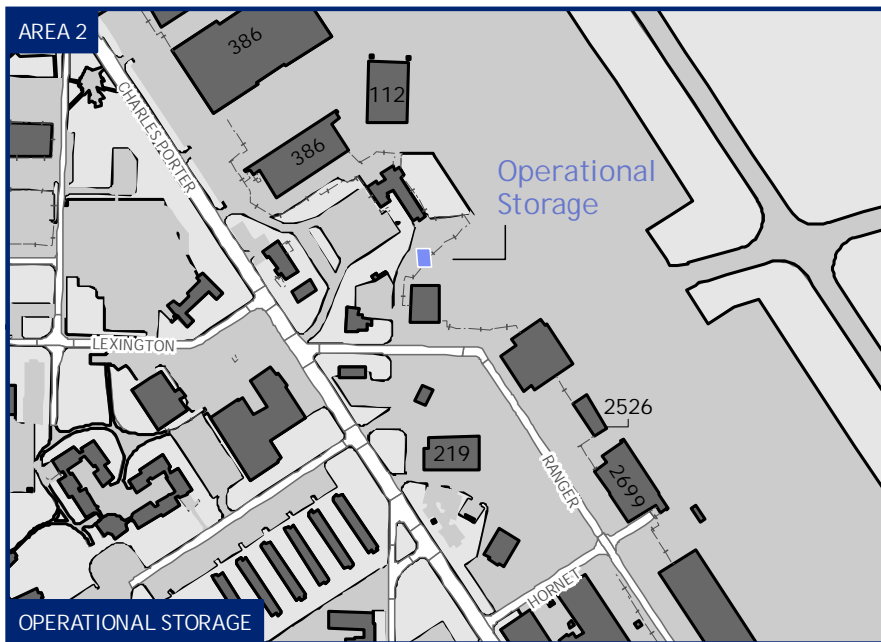
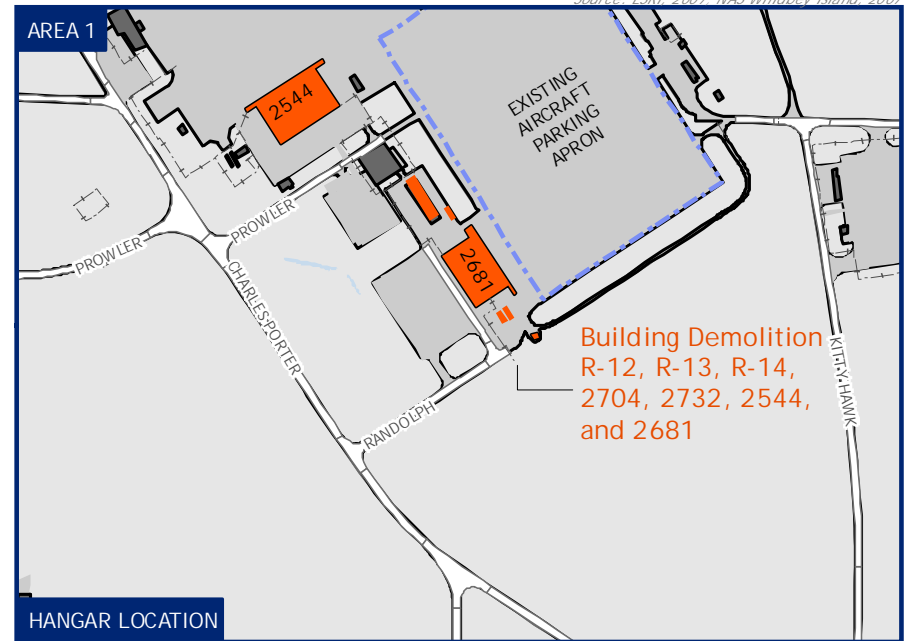
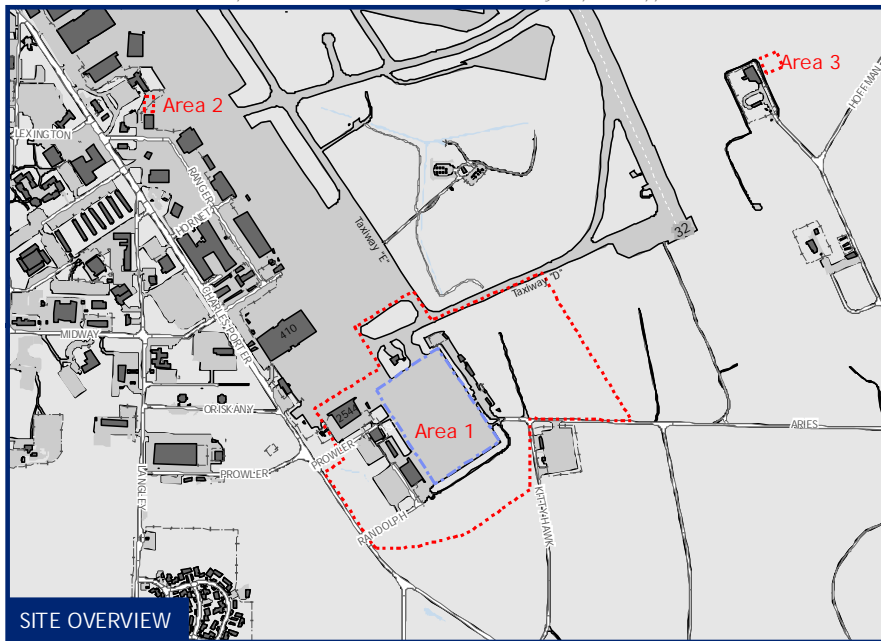


Figure 2-9  
Proposed Conceptual Facilities in Support of All Alternatives  
NAS Whidbey Island, Whidbey Island, Washington



would not require parking apron expansion. Alternatives 1 through 6 would place training facilities inside the new hangar structure.

The size of new facilities would range from 175,128 square feet (Alternative 1) to 413,970 square feet (Alternative 4). Hangar size would range from a two-bay hangar under Alternative 1 (three squadrons) to a six-bay hangar under both Alternatives 2 (seven squadrons) and 4 (five squadrons with FRS). Under Alternatives 2, 3, 4, and 6, separate operational and ordnance storage facilities (maximum of 10,529 square feet) would be constructed next to existing facilities located west and east of the flight line, respectively.

The parking apron expansion would require demolishing Buildings 2666, 2786, 2800, 2621A, 2621, and 2707, currently used for storage and warehousing and located east of the existing aircraft parking apron. Demolished facilities would be rebuilt north of Torpedo Road, just south of the new apron expansion, and would total approximately 11,300 square feet. In order to accommodate vehicle parking for all facilities along the southeast end of the flight line, Hangar 7 (Building 2544) would be demolished. Hangar 7, which is approximately 53,000 square feet, is currently used as an operational maintenance hangar but would not be rebuilt.

Construction of all facilities would result in new impervious surface at the installation ranging from approximately 5.6 acres under Alternatives 1 and 5 to 32.6 acres under Alternative 2.

### **2.5.3 MCBH Kaneohe Bay**

Figures 2-10, 2-11, and 2-12 depict the locations of facilities that would be needed at MCBH Kaneohe Bay. The MMA facilities plan for MCBH Kaneohe Bay was modified slightly from the design plan that was presented in the Draft EIS based on a Marine Corps' basing assessment that evaluated physical footprint and airfield safety conflicts associated with contemplated Marine aviation requirements, including the MV-22 and other existing tenant requirements.

Under Alternatives 1 and 3 through 6, a new hangar would be constructed to house aircraft and provide administrative space. The hangar would be constructed south of the main runway and Taxiway A. Hangar construction would require demolishing five existing structures: a sonobuoy storage building (Bldg. 6657), a magazine armory (Bldg. 4054), a vehicle washrack (Facility 1669), an engine test cell facility (Bldg. 1178), and a ground-level water tank (Facility

1187). Alternative 2 (permanent detachment) would not require construction of a new hangar. Existing aircraft parking apron space is sufficient to support the P-8A MMA under all alternatives. There would however need to be an apron access area created, connecting the new hangar to the existing aircraft parking apron. A POV parking area would be constructed for all alternatives next to the hangar and the training facility to accommodate up to 311 POVs. Under Alternatives 1, 3, 4, 5, and 6, an addition to Building 6468 would also be needed to support training facilities. A training facility is not required under Alternative 2. All proposed new facilities would add approximately four acres of new impervious surface at the installation under all alternatives except Alternative 2.

#### **2.5.4 NAS North Island**

Existing facilities are sufficient for hosting temporary detachments of the P-8A MMA. No new construction would be required. Because of the short duration of detachment time at NAS North Island, the P-8A MMAs would not require their own hangar while there. The P-8A MMA would be parked on the existing aircraft parking apron. Construction of training facilities and buildings to house aircraft simulators would not be required at this base.

#### **2.5.5 The No Action Alternative**

Pursuant to 40 CFR § 1502.14(d), the No Action Alternative must be analyzed in an EIS. “No Action” means an action would not take place. The No Action Alternative provides a benchmark so that decision makers can compare the magnitude of potential environmental effects of the proposed action or alternatives with baseline conditions.

Under the No Action Alternative, no new or expanded facilities would be constructed, and there would be no increase in functional capacity at any alternative homebasing site. The No Action Alternative does not meet the purpose and need of the proposed action. However, the No Action Alternative serves as a baseline for describing and quantifying the impacts associated with the various basing alternatives described in detail. It provides a benchmark using P-3C flight operations to compare the necessary aircraft operations, personnel transition and new construction or renovation of structures to accommodate the P-8A MMA.

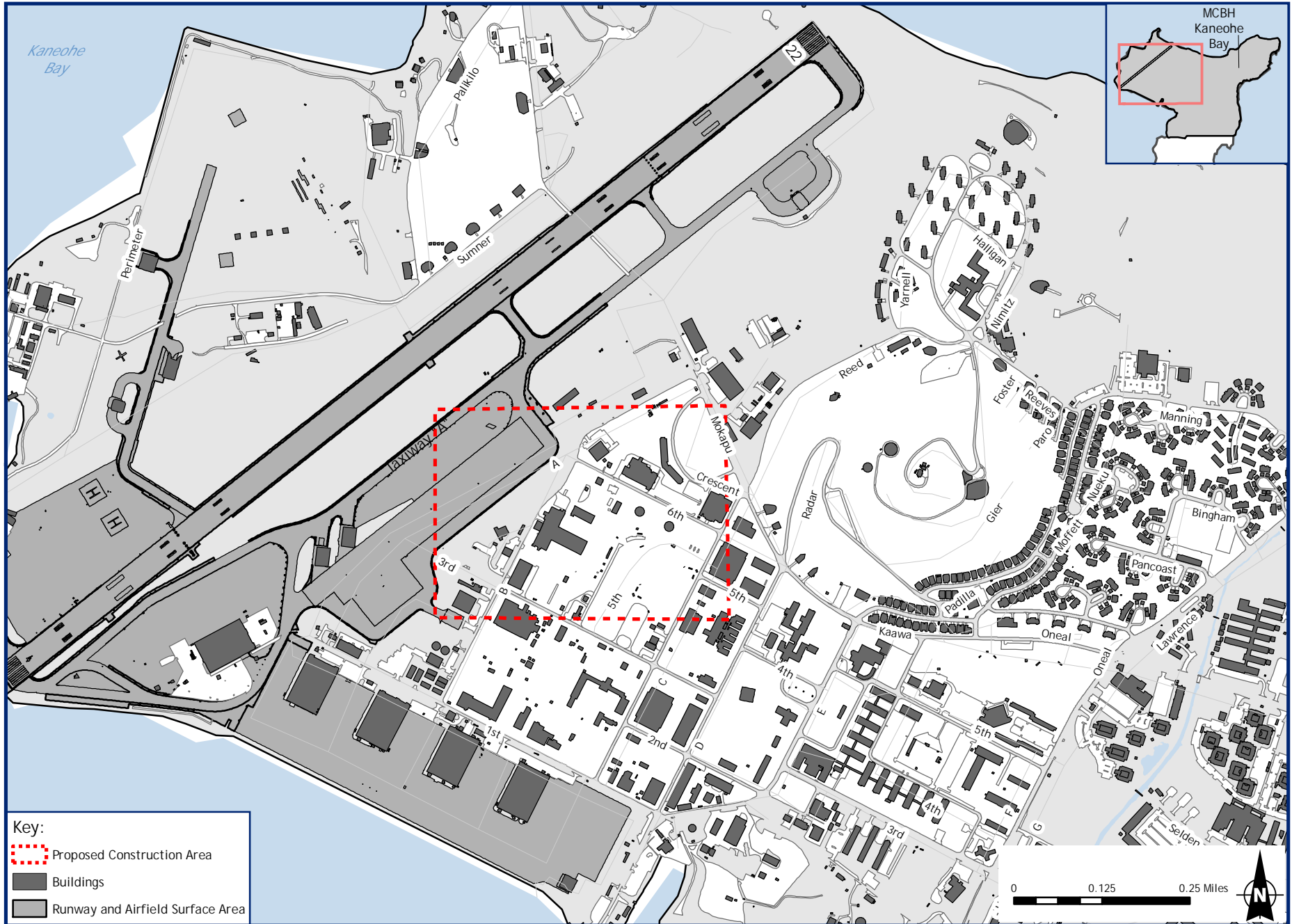


Figure 2-10  
 Proposed Construction Areas - MCBH Kaneohe Bay  
 Oahu, Hawaii



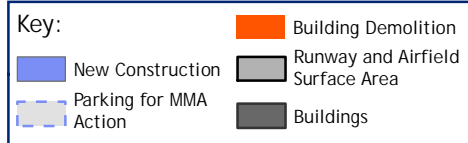
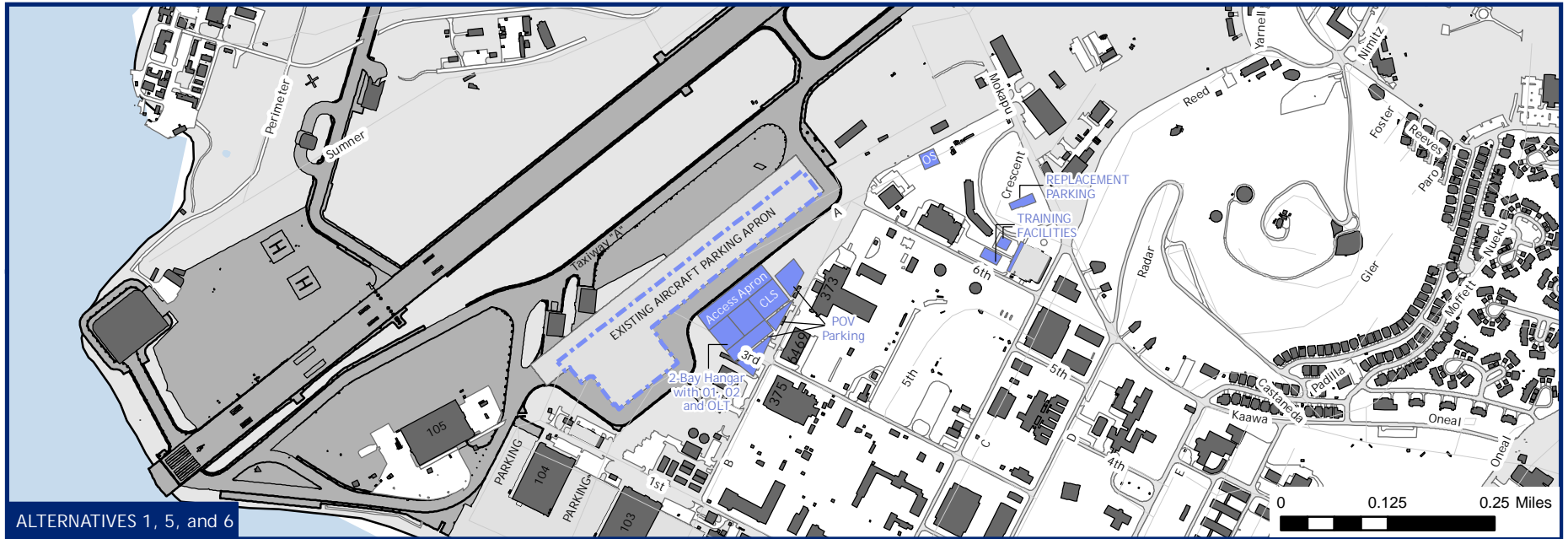


Figure 2-11  
 Conceptual Layout of Planned Facilities for Alternatives 1, 5, and 6  
 MCBH Kaneohe Bay, Oahu, Hawaii



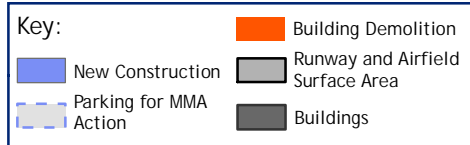
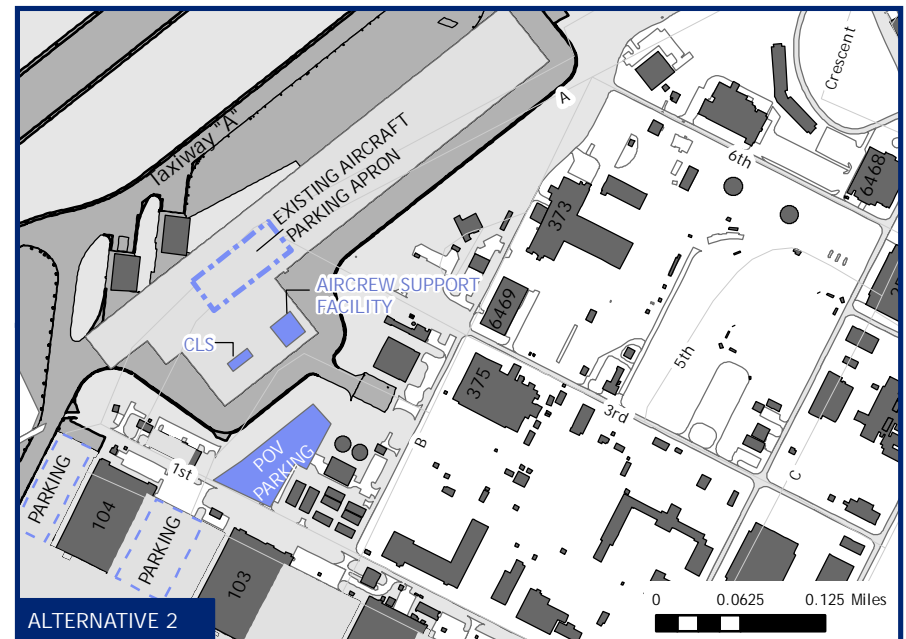
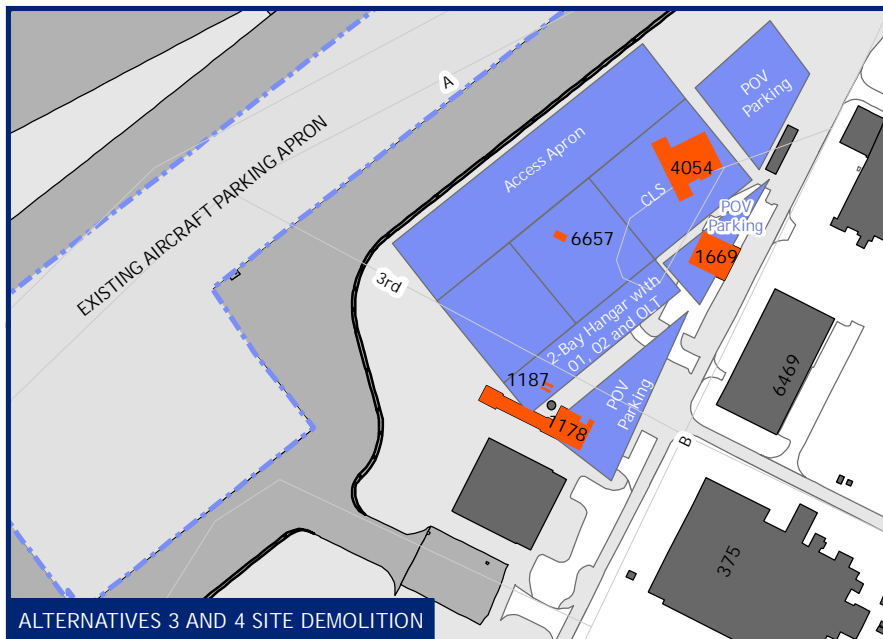
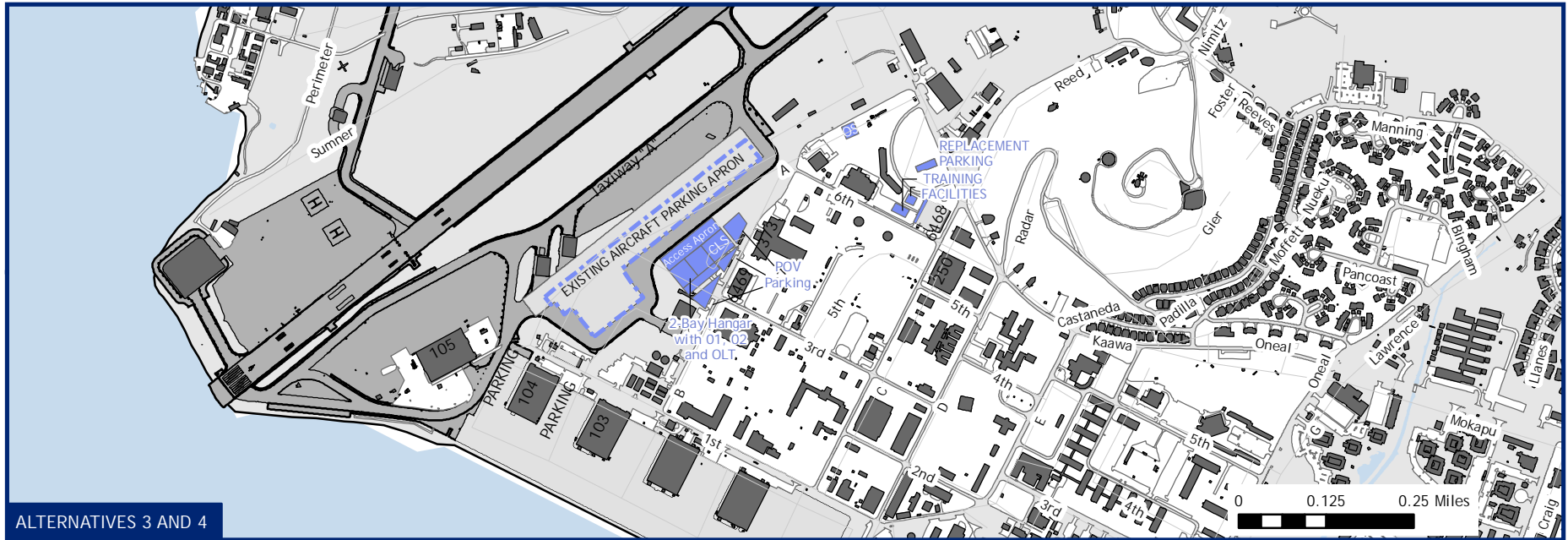


Figure 2-12  
Conceptual Layout of Planned Facilities For Alternatives 3, 4, and 2  
MCBH Kaneohe Bay, Oahu, Hawaii



## **2.6 Alternatives Considered but Eliminated**

Hickam Air Force Base (AFB) was initially considered as a potential homebase or permanent detachment site for the P-8A MMA in Hawaii. As such, the Air Force participated in the development of this EIS as a cooperating agency. An Air Force siting study (U.S. Air Force 2007) identified significant concerns regarding the viability of alternatives, and subsequent analysis identified two reasons that Hickam AFB did not meet the purpose and need.

First, all alternatives that would site the P-8A MMA at Hickam AFB are not operationally feasible because ordnance handling and storage operations under all alternatives would exceed DoD explosive safety criteria. Explosive safety arcs for P-8A MMA operations at Hickam AFB would impinge on the Honolulu International Airport runway, and the increased risks to military personnel and the public would require a dual waiver from the Secretary of the Navy and the Secretary of the Air Force. The waiver must document that no reasonable alternative sites exist where explosive safety criteria can be met for the proposed action. Under the proposed action, another alternative does exist at MCBH Kaneohe Bay that remains a viable alternative as a homebase or detachment site for the P-8A MMA in Hawaii.

Secondly, there is a lack of developable land and infrastructure to support the homebasing or detachment alternative at Hickam AFB. The Air Force siting survey determined that no space is available at Hickam AFB to construct a ramp capable of supporting three P-8A MMA fleet squadrons at the base. An Installation Restoration Program (IRP) site is the only land available for construction of hangar and ramp space to support either two squadrons or detachment alternatives. Remediation of the IRP site would require the excavation, disruption, transfer, and placement of 3 acres of contaminated soil. Additionally, the site survey was unable to identify developable land to support the required FTC facilities at Hickam AFB in conjunction with homebasing two or three fleet squadrons.

A Navy study validated the Air Force siting study findings. Based on the above factors and the availability of existing P-3C homebase infrastructure at MCBH Kaneohe Bay that can meet the purpose and need under all alternatives, the Hickam AFB alternatives were eliminated from further analysis.



## **2.7 Infrastructure Lifecycle Cost Analysis**

The project life for the lifecycle cost analysis is 32 years. The project life consists of two components: the economic life of 30 years and the lead time of two years. The lead time is the construction period for the facility projects that need to be completed by the IOC of 2013. Therefore, the baseline year net-present value figures for the lifecycle cost analysis is 2011. The one-time costs include the construction and renovation costs needed to support the P-8A MMA. The logistical tail associated with basing the P-8A MMA would have the following facilities, personnel, and equipment expenses:

- Initial facility construction/renovation and ancillary costs;
- Annual facilities sustainment and operations costs;
- Annual basic allowance for housing costs for family and bachelor quarters; and
- Initial costs for trainer equipment.

Recurring costs associated with facility maintenance and operations and personnel support under each alternative include annual expenses that would be incurred and include:

- Expenses for operation and maintenance of new and/or renovated facilities. These costs include anticipated annual maintenance for general upkeep of the facilities and repairs required to preserve or return a facility to such condition that it may be used for its designated purpose. Examples include painting to preserve exterior and interior walls of buildings and seal-coating pavement.
- Utilities.
- Bachelor and family housing. These costs are based on region-specific housing allowances given to Navy/Marine Corps personnel.

Table 2-6 above summarizes the lifecycle costs for each alternative.

## **2.8 Preferred Alternative**

As described earlier in this section, the Navy developed six siting alternatives for detailed analysis. From among these six alternatives, the Navy identified Alternative 5 as the preferred alternative. Alternative 5 would homebase five P-8A MMA fleet squadrons and the FRS at NAS Jacksonville, four fleet squadrons at NAS Whidbey Island, and three fleet squadrons at MCBH Kaneohe Bay, with periodic squadron detachments at NAS North Island. Alternative 5 best

meets mission requirements while optimizing operational efficiencies related to training and contractor logistics support functions.

## **2.9 Comparison of Alternatives**

Table 2-7 summarizes the environmental impacts of each alternative. Potential impacts on individual resource areas are discussed in more detail in Section 4 (NAS Jacksonville); Section 6 (NAS Whidbey Island); Section 8 (MCBH Kaneohe Bay); and Section 10 (NAS North Island). These sections also describe proposed methods for mitigating potential impacts.

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**Table 2-7 Comparison of Environmental Impacts by Alternative**

Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5 Preferred Alternative	Alternative 6	No Action Alternative
<b>Airfield Operations</b>						
<b><u>NAS Jacksonville</u></b> 13% decrease in airfield operations.	<b><u>NAS Jacksonville</u></b> 21% decrease in airfield operations.	<b><u>NAS Jacksonville</u></b> 21% decrease in airfield operations.	<b><u>NAS Jacksonville</u></b> 39% decrease in airfield operations.	<b><u>NAS Jacksonville</u></b> 21% decrease in airfield operations.	<b><u>NAS Jacksonville</u></b> 39% decrease in airfield operations.	<b><u>NAS Jacksonville</u></b> No change in airfield operations.
<b><u>NAS Whidbey Island</u></b> 7% decrease in airfield operations	<b><u>NAS Whidbey Island</u></b> 30% increase in airfield operations	<b><u>NAS Whidbey Island</u></b> 8% decrease in airfield operations	<b><u>NAS Whidbey Island</u></b> 31% increase in airfield operations	<b><u>NAS Whidbey Island</u></b> <1% decrease in airfield operations	<b><u>NAS Whidbey Island</u></b> 23% increase in airfield operations	<b><u>NAS Whidbey Island</u></b> No change in airfield operations.
<b><u>MCBH Kaneohe Bay</u></b> 10% decrease in airfield operations.	<b><u>MCBH Kaneohe Bay</u></b> 40% decrease in airfield operations.	<b><u>MCBH Kaneohe Bay</u></b> 16% decrease in airfield operations.	<b><u>MCBH Kaneohe Bay</u></b> 16% decrease in airfield operations.	<b><u>MCBH Kaneohe Bay</u></b> 10% decrease in airfield operations.	<b><u>MCBH Kaneohe Bay</u></b> 10% decrease in airfield operations.	<b><u>MCBH Kaneohe Bay</u></b> No change in airfield operations.
<b><u>NAS North Island</u></b> Less than 1% decrease in airfield operations.	<b><u>NAS North Island</u></b> Less than 1% decrease in airfield operations.	<b><u>NAS North Island</u></b> Less than 1% decrease in airfield operations.	<b><u>NAS North Island</u></b> Less than 1% decrease in airfield operations.	<b><u>NAS North Island</u></b> Less than 1% decrease in airfield operations.	<b><u>NAS North Island</u></b> Less than 1% decrease in airfield operations.	<b><u>NAS North Island</u></b> No change in airfield operations.
<b>Noise</b>						
<b><u>NAS Jacksonville</u></b> 108% increase in land area and 175% increase in population within the greater-than-65 dB DNL noise zones.	<b><u>NAS Jacksonville</u></b> 85% increase in land area and 111% increase in population within the greater-than-65 dB DNL noise zones.	<b><u>NAS Jacksonville</u></b> 85% increase in land area and 111% increase in population within the greater-than-65 dB DNL noise zones.	<b><u>NAS Jacksonville</u></b> 26% increase in land area and 37% increase in population within the greater-than-65 dB DNL noise zones.	<b><u>NAS Jacksonville</u></b> 85% increase in land area and 111% increase in population within the greater-than-65 dB DNL noise zones.	<b><u>NAS Jacksonville</u></b> 26% increase in land area and 37% increase in population within the greater-than-65 dB DNL noise zones.	<b><u>NAS Jacksonville</u></b> No change in land area and population within the greater-than-65 dB DNL noise zones.
<b><u>NAS Whidbey Island</u></b> Less than 1% decrease in land area and 7% increase in population within the greater-than-65 dB DNL noise zones.	<b><u>NAS Whidbey Island</u></b> Less than 1% increase in land area and 7% increase in population within the greater-than-65 dB DNL noise zones.	<b><u>NAS Whidbey Island</u></b> Less than 1% increase in land area and 7% increase in population within the greater-than-65 dB DNL noise zones.	<b><u>NAS Whidbey Island</u></b> Less than 1% increase in land area and 7% increase in population within the greater-than-65 dB DNL noise zones.	<b><u>NAS Whidbey Island</u></b> Less than 1% increase in land area and 7% increase in population within the greater-than-65 dB DNL noise zones.	<b><u>NAS Whidbey Island</u></b> Less than 1% increase in land area and 7% increase in population within the greater-than-65 dB DNL noise zones.	<b><u>NAS Whidbey Island</u></b> No change in land area and population within the greater-than-65 dB DNL noise zones.
<b><u>MCBH Kaneohe Bay</u></b> 5% increase in land area and no change in population within the greater-than-65 dB DNL noise zones.	<b><u>MCBH Kaneohe Bay</u></b> 0% increase in land area and no change in population within the greater-than-65 dB DNL noise zones.	<b><u>MCBH Kaneohe Bay</u></b> 5% decrease in land area and no change in population within the greater-than-65 dB DNL noise zones.	<b><u>MCBH Kaneohe Bay</u></b> 5% decrease in land area and no change in population within the greater-than-65 dB DNL noise zones.	<b><u>MCBH Kaneohe Bay</u></b> 5% increase in land area and no change in population within the greater-than-65 dB DNL noise zones.	<b><u>MCBH Kaneohe Bay</u></b> 5% increase in land area and no change in population within the greater-than-65 dB DNL noise zones.	<b><u>MCBH Kaneohe Bay</u></b> No change in land area and population within the greater-than-65 dB DNL noise zones.

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**Table 2-7 Comparison of Environmental Impacts by Alternative (continued)**

<b>Alternative 1</b>	<b>Alternative 2</b>	<b>Alternative 3</b>	<b>Alternative 4</b>	<b>Alternative 5 Preferred Alternative</b>	<b>Alternative 6</b>	<b>No Action Alternative</b>
<b><u>NAS North Island</u></b> 1% decrease in land area and 2% decrease in population within the greater-than-65 dB DNL noise zones.	<b><u>NAS North Island</u></b> 1% decrease in land area and 2% decrease in population within the greater-than-65 dB DNL noise zones.	<b><u>NAS North Island</u></b> 1% decrease in land area and 2% decrease in population within the greater-than-65 dB DNL noise zones.	<b><u>NAS North Island</u></b> 1% decrease in land area and 2% decrease in population within the greater-than-65 dB DNL noise zones.	<b><u>NAS North Island</u></b> 1% decrease in land area and 2% decrease in population within the greater-than-65 dB DNL noise zones.	<b><u>NAS North Island</u></b> 1% decrease in land area and 2% decrease in population within the greater-than-65 dB DNL noise zones.	<b><u>NAS North Island</u></b> No change in land area and population within the greater-than-65 dB DNL noise zones.
<b>Land Use</b>						
<b><u>NAS Jacksonville</u></b> 59 additional acres of residential land within the 65-70 dB DNL noise zone.	<b><u>NAS Jacksonville</u></b> 41 additional acres of residential land within the 65-70 dB DNL noise zone.	<b><u>NAS Jacksonville</u></b> 41 additional acres of residential land within the 65-70 dB DNL noise zone.	<b><u>NAS Jacksonville</u></b> 9 additional acres of residential land within the 65-70 dB DNL noise zone.	<b><u>NAS Jacksonville</u></b> 41 additional acres of residential land within the 65-70 dB DNL noise zone.	<b><u>NAS Jacksonville</u></b> 9 additional acres of residential land within the 65-70 dB DNL noise zone.	<b><u>NAS Jacksonville</u></b> No change in land uses within noise zones.
<b><u>NAS Whidbey Island</u></b> No additional incompatible land uses within noise zones.	<b><u>NAS Whidbey Island</u></b> No additional incompatible land uses within noise zones.	<b><u>NAS Whidbey Island</u></b> No additional incompatible land uses within noise zones.	<b><u>NAS Whidbey Island</u></b> No additional incompatible land uses within noise zones.	<b><u>NAS Whidbey Island</u></b> No additional incompatible land uses within noise zones.	<b><u>NAS Whidbey Island</u></b> No additional incompatible land uses within noise zones.	<b><u>NAS Whidbey Island</u></b> No change in land uses within noise zones.
<b><u>MCBH Kaneohe Bay</u></b> No additional incompatible land uses within noise zones.	<b><u>MCBH Kaneohe Bay</u></b> No additional incompatible land uses within noise zones.	<b><u>MCBH Kaneohe Bay</u></b> No additional incompatible land uses within noise zones.	<b><u>MCBH Kaneohe Bay</u></b> No additional incompatible land uses within noise zones.	<b><u>MCBH Kaneohe Bay</u></b> No additional incompatible land uses within noise zones.	<b><u>MCBH Kaneohe Bay</u></b> No additional incompatible land uses within noise zones.	<b><u>MCBH Kaneohe Bay</u></b> No change in land uses within noise zones.
<b><u>NAS North Island</u></b> No incompatible land uses within noise zones.	<b><u>NAS North Island</u></b> No incompatible land uses within noise zones.	<b><u>NAS North Island</u></b> No incompatible land uses within noise zones.	<b><u>NAS North Island</u></b> No incompatible land uses within noise zones.	<b><u>NAS North Island</u></b> No incompatible land uses within noise zones.	<b><u>NAS North Island</u></b> No incompatible land uses within noise zones.	<b><u>NAS North Island</u></b> No change in land uses within noise zones.
<b>Air Quality</b>						
<b><u>NAS Jacksonville</u></b> Temporary construction emissions and projected annual operating emissions are below 250 tpy (tons per year) for all criteria pollutants.  Projected decrease in operating emissions.	<b><u>NAS Jacksonville</u></b> Temporary construction emissions and projected annual operating emissions are below 250 tpy (tons per year) for all criteria pollutants.  Projected decrease in operating emissions.	<b><u>NAS Jacksonville</u></b> Temporary construction emissions and projected annual operating emissions are below 250 tpy (tons per year) for all criteria pollutants.  Projected decrease in operating emissions.	<b><u>NAS Jacksonville</u></b> Temporary construction emissions and projected annual operating emissions are below 250 tpy (tons per year) for all criteria pollutants.  Projected decrease in operating emissions.	<b><u>NAS Jacksonville</u></b> Temporary construction emissions and projected annual operating emissions are below 250 tpy (tons per year) for all criteria pollutants.  Projected decrease in operating emissions.	<b><u>NAS Jacksonville</u></b> Temporary construction emissions and projected annual operating emissions are below 250 tpy (tons per year) for all criteria pollutants.  Projected decrease in operating emissions.	<b><u>NAS Jacksonville</u></b> No construction emissions or impacts on regional air quality.

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**Table 2-7 Comparison of Environmental Impacts by Alternative (continued)**

Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5 Preferred Alternative	Alternative 6	No Action Alternative
<b><u>NAS Whidbey Island</u></b> Temporary construction emissions and projected annual operating emissions are below 250 tpy (tons per year) for all criteria pollutants.	<b><u>NAS Whidbey Island</u></b> Temporary construction emissions and projected annual operating emissions are below 250 tpy (tons per year) for all criteria pollutants.	<b><u>NAS Whidbey Island</u></b> Temporary construction emissions and projected annual operating emissions are below 250 tpy (tons per year) for all criteria pollutants.	<b><u>NAS Whidbey Island</u></b> Temporary construction emissions and projected annual operating emissions are below 250 tpy (tons per year) for all criteria pollutants.	<b><u>NAS Whidbey Island</u></b> Temporary construction emissions and projected annual operating emissions are below 250 tpy (tons per year) for all criteria pollutants.	<b><u>NAS Whidbey Island</u></b> Temporary construction emissions and projected annual operating emissions are below 250 tpy (tons per year) for all criteria pollutants.	<b><u>NAS Whidbey Island</u></b> No construction emissions or impacts on regional air quality.
<b><u>MCBH Kaneohe Bay</u></b> Temporary construction emissions and projected annual operating emissions are below 250 tpy (tons per year) for all criteria pollutants.	<b><u>MCBH Kaneohe Bay</u></b> Temporary construction emissions and projected annual operating emissions are below 250 tpy (tons per year) for all criteria pollutants.	<b><u>MCBH Kaneohe Bay</u></b> Temporary construction emissions and projected annual operating emissions are below 250 tpy (tons per year) for all criteria pollutants.	<b><u>MCBH Kaneohe Bay</u></b> Temporary construction emissions and projected annual operating emissions are below 250 tpy (tons per year) for all criteria pollutants.	<b><u>MCBH Kaneohe Bay</u></b> Temporary construction emissions and projected annual operating emissions are below 250 tpy (tons per year) for all criteria pollutants.	<b><u>MCBH Kaneohe Bay</u></b> Temporary construction emissions and projected annual operating emissions are below 250 tpy (tons per year) for all criteria pollutants.	<b><u>MCBH Kaneohe Bay</u></b> No construction emissions or impacts on regional air quality.
Projected decrease in operating emissions.	Projected decrease in operating emissions.	Projected decrease in operating emissions.	Projected decrease in operating emissions.	Projected decrease in operating emissions.	Projected decrease in operating emissions.	
<b><u>NAS North Island</u></b> No construction emissions or impacts on regional air quality.	<b><u>NAS North Island</u></b> No construction emissions or impacts on regional air quality.	<b><u>NAS North Island</u></b> No construction emissions or impacts on regional air quality.	<b><u>NAS North Island</u></b> No construction emissions or impacts on regional air quality.	<b><u>NAS North Island</u></b> No construction emissions or impacts on regional air quality.	<b><u>NAS North Island</u></b> No construction emissions or impacts on regional air quality.	<b><u>NAS North Island</u></b> No construction emissions or impacts on regional air quality.
<b>Socioeconomics – Population and Housing</b>						
<b><u>NAS Jacksonville</u></b> 0.6% decrease in regional population	<b><u>NAS Jacksonville</u></b> 0.7% decrease in regional population.	<b><u>NAS Jacksonville</u></b> 0.7% decrease in regional population.	<b><u>NAS Jacksonville</u></b> 0.8% decrease in regional population.	<b><u>NAS Jacksonville</u></b> 0.7% decrease in regional population.	<b><u>NAS Jacksonville</u></b> 0.8% decrease in regional population.	<b><u>NAS Jacksonville</u></b> No change in regional population.
<b><u>NAS Whidbey Island</u></b> 2.2% decrease in regional population.	<b><u>NAS Whidbey Island</u></b> 1.6% increase in regional population.	<b><u>NAS Whidbey Island</u></b> Less than 0.1% decrease in regional population.	<b><u>NAS Whidbey Island</u></b> 1.2% increase in regional population.	<b><u>NAS Whidbey Island</u></b> 1.2% decrease in regional population.	<b><u>NAS Whidbey Island</u></b> 0.1% increase in regional population.	<b><u>NAS Whidbey Island</u></b> No change in regional population.
<b><u>MCBH Kaneohe Bay</u></b> 0.2% decrease in regional population.	<b><u>MCBH Kaneohe Bay</u></b> 0.5% decrease in regional population.	<b><u>MCBH Kaneohe Bay</u></b> 0.3% decrease in regional population.	<b><u>MCBH Kaneohe Bay</u></b> 0.3% decrease in regional population.	<b><u>MCBH Kaneohe Bay</u></b> 0.2% decrease in regional population.	<b><u>MCBH Kaneohe Bay</u></b> 0.2% decrease in regional population.	<b><u>MCBH Kaneohe Bay</u></b> No change in regional population.
<b><u>NAS North Island</u></b> No change in regional population.	<b><u>NAS North Island</u></b> No change in regional population.	<b><u>NAS North Island</u></b> No change in regional population.	<b><u>NAS North Island</u></b> No change in regional population.	<b><u>NAS North Island</u></b> No change in regional population.	<b><u>NAS North Island</u></b> No change in regional population.	<b><u>NAS North Island</u></b> No change in regional population.

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**Table 2-7 Comparison of Environmental Impacts by Alternative (continued)**

Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5 Preferred Alternative	Alternative 6	No Action Alternative
<b>Socioeconomics – Regional Economy</b>						
<b><u>NAS Jacksonville</u></b> Approximately \$167.8 million in economic benefits generated by one-time construction expenditures and a decrease of \$250.8 million in total annual earnings.	<b><u>NAS Jacksonville</u></b> Approximately \$167.8 million in economic benefits generated by one-time construction expenditures and a decrease of \$285.9 million in total annual earnings.	<b><u>NAS Jacksonville</u></b> Approximately \$167.8 million in economic benefits generated by one-time construction expenditures and a decrease of \$285.9 million in total annual earnings.	<b><u>NAS Jacksonville</u></b> Approximately \$115.4 million in economic benefits generated by one-time construction expenditures and a decrease of \$328.4 million in total annual earnings.	<b><u>NAS Jacksonville</u></b> Approximately \$167.8 million in economic benefits generated by one-time construction expenditures and a decrease of \$285.9 million in total annual earnings.	<b><u>NAS Jacksonville</u></b> Approximately \$115.4 million in economic benefits generated by one-time construction expenditures and a decrease of \$328.4 million in total annual earnings.	<b><u>NAS Jacksonville</u></b> No change in regional economy.
<b><u>NAS Whidbey Island</u></b> Approximately \$342.7 million in economic benefits generated by one-time construction expenditures and a decrease of \$78.3 million in total annual earnings.	<b><u>NAS Whidbey Island</u></b> Approximately \$768.1 million in economic benefits generated by one-time construction expenditures and an increase of \$90.4 million in total annual earnings.	<b><u>NAS Whidbey Island</u></b> Approximately \$562.2 million in economic benefits generated by one-time construction expenditures and an increase of \$20.6 million in total annual earnings.	<b><u>NAS Whidbey Island</u></b> Approximately \$817.6 million in economic benefits generated by one-time construction expenditures and an increase of \$63.2 million in total annual earnings.	<b><u>NAS Whidbey Island</u></b> Approximately \$411.4 million in economic benefits generated by one-time construction expenditures and a decrease of \$28.8 million in total annual earnings.	<b><u>NAS Whidbey Island</u></b> Approximately \$707.0 million in economic benefits generated by one-time construction expenditures and an increase of \$13.7 million in total annual earnings.	<b><u>NAS Whidbey Island</u></b> No change in regional economy.
<b><u>MCBH Kaneohe Bay</u></b> Approximately \$445.8 million in economic benefits generated by one-time construction expenditures and a decrease of \$93.5 million in total annual earnings.	<b><u>MCBH Kaneohe Bay</u></b> Approximately \$14.9 million in economic benefits generated by one-time construction expenditures and a decrease of \$239.6 million in total annual earnings.	<b><u>MCBH Kaneohe Bay</u></b> Approximately \$412.4 million in economic benefits generated by one-time construction expenditures and a decrease of \$138.7 million in total annual earnings.	<b><u>MCBH Kaneohe Bay</u></b> Approximately \$ 412.4 million in economic benefits generated by one-time construction expenditures and a decrease of \$138.7 million in total annual earnings.	<b><u>MCBH Kaneohe Bay</u></b> Approximately \$445.8 million in economic benefits generated by one-time construction expenditures and a decrease of \$93.5 million in total annual earnings.	<b><u>MCBH Kaneohe Bay</u></b> Approximately \$445.8 million in economic benefits generated by one-time construction expenditures and a decrease of \$93.5 million in total annual earnings.	<b><u>MCBH Kaneohe Bay</u></b> No change in regional economy.
<b><u>NAS North Island</u></b> No significant impact on regional economy.	<b><u>NAS North Island</u></b> No significant impact on regional economy.	<b><u>NAS North Island</u></b> No significant impact on regional economy.	<b><u>NAS North Island</u></b> No significant impact on regional economy.	<b><u>NAS North Island</u></b> No significant impact on regional economy.	<b><u>NAS North Island</u></b> No significant impact on regional economy.	<b><u>NAS North Island</u></b> No change in regional economy.
<b>Socioeconomics – Education</b>						
<b><u>NAS Jacksonville</u></b> Less than 1% decrease in total school district enrollment.	<b><u>NAS Jacksonville</u></b> Less than 1% decrease in total school district enrollment.	<b><u>NAS Jacksonville</u></b> Less than 1% decrease in total school district enrollment.	<b><u>NAS Jacksonville</u></b> Less than 1% decrease in total school district enrollment.	<b><u>NAS Jacksonville</u></b> Less than 1% decrease in total school district enrollment.	<b><u>NAS Jacksonville</u></b> Less than 1% decrease in total school district enrollment.	<b><u>NAS Jacksonville</u></b> No change in total school district enrollment.
<b><u>NAS Whidbey Island</u></b> 4.3% decrease in total school district enrollment.	<b><u>NAS Whidbey Island</u></b> 4.4% increase in total school district enrollment.	<b><u>NAS Whidbey Island</u></b> 0.8% increase in total school district enrollment.	<b><u>NAS Whidbey Island</u></b> 3.5% increase in total school district enrollment.	<b><u>NAS Whidbey Island</u></b> 2.2% decrease in total school district enrollment.	<b><u>NAS Whidbey Island</u></b> 1.0% increase in total school district enrollment.	<b><u>NAS Whidbey Island</u></b> No change in total school district enrollment.

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**Table 2-7 Comparison of Environmental Impacts by Alternative (continued)**

Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5 Preferred Alternative	Alternative 6	No Action Alternative
<b><u>MCBH Kaneohe Bay</u></b> 6.8% decrease in total school district enrollment.	<b><u>MCBH Kaneohe Bay</u></b> 17.3% decrease in total school district enrollment.	<b><u>MCBH Kaneohe Bay</u></b> 10.1% decrease in total school district enrollment.	<b><u>MCBH Kaneohe Bay</u></b> 10.1% decrease in total school district enrollment.	<b><u>MCBH Kaneohe Bay</u></b> 6.8% decrease in total school district enrollment.	<b><u>MCBH Kaneohe Bay</u></b> 6.8% decrease in total school district enrollment.	<b><u>MCBH Kaneohe Bay</u></b> No change in total school district enrollment.
<b><u>NAS North Island</u></b> No change in total school district enrollment.	<b><u>NAS North Island</u></b> No change in total school district enrollment.	<b><u>NAS North Island</u></b> No change in total school district enrollment.	<b><u>NAS North Island</u></b> No change in total school district enrollment.	<b><u>NAS North Island</u></b> No change in total school district enrollment.	<b><u>NAS North Island</u></b> No change in total school district enrollment.	<b><u>NAS North Island</u></b> No change in total school district enrollment.
<b>Socioeconomics – Environmental Justice</b>						
<b><u>NAS Jacksonville</u></b> Potential for disproportionately high and adverse environmental and human health impacts on minority populations and children. No potential impacts for low-income populations.	<b><u>NAS Jacksonville</u></b> Potential for disproportionately high and adverse environmental and human health impacts on minority populations and children. No potential impacts for low-income populations.	<b><u>NAS Jacksonville</u></b> Potential for disproportionately high and adverse environmental and human health impacts on minority populations and children. No potential impacts for low-income populations.	<b><u>NAS Jacksonville</u></b> Potential for disproportionately high and adverse environmental and human health impacts on minority populations and children. No potential impacts for low-income populations.	<b><u>NAS Jacksonville</u></b> Potential for disproportionately high and adverse environmental and human health impacts on minority populations and children. No potential impacts for low-income populations.	<b><u>NAS Jacksonville</u></b> Potential for disproportionately high and adverse environmental and human health impacts on minority populations and children. No potential impacts for low-income populations.	<b><u>NAS Jacksonville</u></b> Existing potential for disproportionately high and adverse impacts on minority populations, low-income populations, and environmental health and safety risks for children.
<b><u>NAS Whidbey Island</u></b> No change from baseline in the potential for disproportionately high and adverse impact on minority and low-income populations and environmental health and safety risk for children.	<b><u>NAS Whidbey Island</u></b> No change from baseline in the potential for disproportionately high and adverse impact on minority and low-income populations and environmental health and safety risk for children.	<b><u>NAS Whidbey Island</u></b> No change from baseline in the potential for disproportionately high and adverse impact on minority and low-income populations and environmental health and safety risk for children.	<b><u>NAS Whidbey Island</u></b> No change from baseline in the potential for disproportionately high and adverse impact on minority and low-income populations and environmental health and safety risk for children.	<b><u>NAS Whidbey Island</u></b> No change from baseline in the potential for disproportionately high and adverse impact on minority and low-income populations and environmental health and safety risk for children.	<b><u>NAS Whidbey Island</u></b> No change from baseline in the potential for disproportionately high and adverse impact on minority and low-income populations and environmental health and safety risk for children.	<b><u>NAS Whidbey Island</u></b> Existing potential for disproportionately high and adverse impact on minority and low-income populations and environmental health and safety risks for children.
<b><u>MCBH Kaneohe Bay</u></b> No change from the baseline in the potential for disproportionately high and adverse impact on minority and low-income populations. No potential environmental health or safety risks for children.	<b><u>MCBH Kaneohe Bay</u></b> No change from the baseline in the potential for disproportionately high and adverse impact on minority and low-income populations. No potential environmental health or safety risks for children.	<b><u>MCBH Kaneohe Bay</u></b> No change from the baseline in the potential for disproportionately high and adverse impact on minority and low-income populations. No potential environmental health or safety risks for children.	<b><u>MCBH Kaneohe Bay</u></b> No change from the baseline in the potential for disproportionately high and adverse impact on minority and low-income populations. No potential environmental health or safety risks for children.	<b><u>MCBH Kaneohe Bay</u></b> No change from the baseline in the potential for disproportionately high and adverse impact on minority and low-income populations. No potential environmental health or safety risks for children.	<b><u>MCBH Kaneohe Bay</u></b> No change from the baseline in the potential for disproportionately high and adverse impact on minority and low-income populations. No potential environmental health or safety risks for children.	<b><u>MCBH Kaneohe Bay</u></b> Existing potential for disproportionately high and adverse impact on minority and low-income populations and environmental health and safety risks for children.

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**Table 2-7 Comparison of Environmental Impacts by Alternative (continued)**

<b>Alternative 1</b>	<b>Alternative 2</b>	<b>Alternative 3</b>	<b>Alternative 4</b>	<b>Alternative 5 Preferred Alternative</b>	<b>Alternative 6</b>	<b>No Action Alternative</b>
<b><u>NAS North Island</u></b> No change from the baseline in the potential for disproportionately high and adverse impact on minority populations and low-income populations and environmental health and safety risk for children.	<b><u>NAS North Island</u></b> No change from the baseline in the potential for disproportionately high and adverse impact on minority populations and low-income populations and environmental health and safety risk for children.	<b><u>NAS North Island</u></b> No change from the baseline in the potential for disproportionately high and adverse impact on minority populations and low-income populations and environmental health and safety risk for children.	<b><u>NAS North Island</u></b> No change from the baseline in the potential for disproportionately high and adverse impact on minority populations and low-income populations and environmental health and safety risk for children.	<b><u>NAS North Island</u></b> No change from the baseline in the potential for disproportionately high and adverse impact on minority populations and low-income populations and environmental health and safety risk for children.	<b><u>NAS North Island</u></b> No change from the baseline in the potential for disproportionately high and adverse impact on minority populations and low-income populations and environmental health and safety risk for children.	<b><u>NAS North Island</u></b> Existing potential for disproportionately high and adverse impact on minority populations.
<b>Topography and Soils</b>						
<b><u>NAS Jacksonville</u></b> No change to topography and no significant filling or grading.	<b><u>NAS Jacksonville</u></b> No change to topography and no significant filling or grading.	<b><u>NAS Jacksonville</u></b> No change to topography and no significant filling or grading.	<b><u>NAS Jacksonville</u></b> No change to topography and no significant filling or grading.	<b><u>NAS Jacksonville</u></b> No change to topography and no significant filling or grading.	<b><u>NAS Jacksonville</u></b> No change to topography and no significant filling or grading.	<b><u>NAS Jacksonville</u></b> No impact on soils or topography.
<b><u>NAS Whidbey Island</u></b> Estimated 1 to 2 foot increase in surface elevations; requires less than 0.2 acres of fill.	<b><u>NAS Whidbey Island</u></b> Estimated 1 to 2 foot increase in surface elevations; requires approximately 6.7 acres of fill.	<b><u>NAS Whidbey Island</u></b> Estimated 1 to 2 foot increase in surface elevations; requires approximately 2.4 acres of fill.	<b><u>NAS Whidbey Island</u></b> Estimated 1 to 2 foot increase in surface elevations; requires approximately 6.7 acres of fill.	<b><u>NAS Whidbey Island</u></b> Estimated 1 to 2 foot increase in surface elevations; requires less than 0.2 acres of fill.	<b><u>NAS Whidbey Island</u></b> Estimated 1 to 2 foot increase in surface elevations; requires approximately 2.1 acres of fill.	<b><u>NAS Whidbey Island</u></b> No impact on soils or topography.
<b><u>MCBH Kaneohe Bay</u></b> No change to topography and no significant filling or grading.	<b><u>MCBH Kaneohe Bay</u></b> No change to topography and no significant filling or grading.	<b><u>MCBH Kaneohe Bay</u></b> No change to topography and no significant filling or grading.	<b><u>MCBH Kaneohe Bay</u></b> No change to topography and no significant filling or grading.	<b><u>MCBH Kaneohe Bay</u></b> No change to topography and no significant filling or grading.	<b><u>MCBH Kaneohe Bay</u></b> No change to topography and no significant filling or grading.	<b><u>MCBH Kaneohe Bay</u></b> No impact on soils or topography.
<b><u>NAS North Island</u></b> No impact on soils or topography.	<b><u>NAS North Island</u></b> No impact on soils or topography.	<b><u>NAS North Island</u></b> No impact on soils or topography.	<b><u>NAS North Island</u></b> No impact on soils or topography.	<b><u>NAS North Island</u></b> No impact on soils or topography.	<b><u>NAS North Island</u></b> No impact on soils or topography.	<b><u>NAS North Island</u></b> No impact on soils or topography.



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**Table 2-7 Comparison of Environmental Impacts by Alternative (continued)**

Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5 Preferred Alternative	Alternative 6	No Action Alternative
<b>Water Resources (floodplains, water quality, groundwater)</b>						
<b><u>NAS Jacksonville</u></b> With mitigation specified in the Stormwater Pollution Prevention Plan, negligible impacts on water quality and no impact on floodplains or groundwater. Will require revision of the installation's NPDES permit.	<b><u>NAS Jacksonville</u></b> With mitigation specified in the Stormwater Pollution Prevention Plan, negligible impacts on water quality and no impact on floodplains or groundwater. Will require revision of the installation's NPDES permit.	<b><u>NAS Jacksonville</u></b> With mitigation specified in the Stormwater Pollution Prevention Plan, negligible impacts on water quality and no impact on floodplains or groundwater. Will require revision of the installation's NPDES permit.	<b><u>NAS Jacksonville</u></b> With mitigation specified in the Stormwater Pollution Prevention Plan, negligible impacts on water quality and no impact on floodplains or groundwater. Will require revision of the installation's NPDES permit.	<b><u>NAS Jacksonville</u></b> With mitigation specified in the Stormwater Pollution Prevention Plan, negligible impacts on water quality and no impact on floodplains or groundwater. Will require revision of the installation's NPDES permit.	<b><u>NAS Jacksonville</u></b> With mitigation specified in the Stormwater Pollution Prevention Plan, negligible impacts on water quality and no impact on floodplains or groundwater. Will require revision of the installation's NPDES permit.	<b><u>NAS Jacksonville</u></b> No impact on floodplains, water quality, or groundwater.
<b><u>NAS Whidbey Island</u></b> With mitigation specified in the Stormwater Management Plan, no impact on surface water or groundwater. Minor impacts on water quality during construction only. Will require revision of the installation's NPDES permit.	<b><u>NAS Whidbey Island</u></b> With mitigation specified in the Stormwater Management Plan, no impact on surface water or groundwater. Minor impacts on water quality during construction only. Will require revision of the installation's NPDES permit.	<b><u>NAS Whidbey Island</u></b> With mitigation specified in the Stormwater Management Plan, no impact on surface water or groundwater. Minor impacts on water quality during construction only. Will require revision of the installation's NPDES permit.	<b><u>NAS Whidbey Island</u></b> With mitigation specified in the Stormwater Management Plan, no impact on surface water or groundwater. Minor impacts on water quality during construction only. Will require revision of the installation's NPDES permit.	<b><u>NAS Whidbey Island</u></b> With mitigation specified in the Stormwater Management Plan, no impact on surface water or groundwater. Minor impacts on water quality during construction only. Will require revision of the installation's NPDES permit.	<b><u>NAS Whidbey Island</u></b> With mitigation specified in the Stormwater Management Plan, no impact on surface water or groundwater. Minor impacts on water quality during construction only. Will require revision of the installation's NPDES permit.	<b><u>NAS Whidbey Island</u></b> No impact on surface water, water quality, or groundwater.
<b><u>MCBH Kaneohe Bay</u></b> With mitigation specified in the Stormwater Management Plan, no impact on floodplains, water quality, or groundwater. Will require revision of the installation's NPDES permit.	<b><u>MCBH Kaneohe Bay</u></b> With mitigation specified in the Stormwater Management Plan, no impact on floodplains, water quality, or groundwater. Will require revision of the installation's NPDES permit.	<b><u>MCBH Kaneohe Bay</u></b> With mitigation specified in the Stormwater Management Plan, no impact on floodplains, water quality, or groundwater. Will require revision of the installation's NPDES permit.	<b><u>MCBH Kaneohe Bay</u></b> With mitigation specified in the Stormwater Management Plan, no impact on floodplains, water quality, or groundwater. Will require revision of the installation's NPDES permit.	<b><u>MCBH Kaneohe Bay</u></b> With mitigation specified in the Stormwater Management Plan, no impact on floodplains, water quality, or groundwater. Will require revision of the installation's NPDES permit.	<b><u>MCBH Kaneohe Bay</u></b> With mitigation specified in the Stormwater Management Plan, no impact on floodplains, water quality, or groundwater. Will require revision of the installation's NPDES permit.	<b><u>MCBH Kaneohe Bay</u></b> Negligible impacts on water quality and no impact on floodplains or groundwater.
<b><u>NAS North Island</u></b> No impact on floodplains, water quality, or groundwater.	<b><u>NAS North Island</u></b> No impact on floodplains, water quality, or groundwater.	<b><u>NAS North Island</u></b> No impact on floodplains, water quality, or groundwater.	<b><u>NAS North Island</u></b> No impact on floodplains, water quality, or groundwater.	<b><u>NAS North Island</u></b> No impact on floodplains, water quality, or groundwater.	<b><u>NAS North Island</u></b> No impact on floodplains, water quality, or groundwater.	<b><u>NAS North Island</u></b> No impact on floodplains, water quality, or groundwater.

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**Table 2-7 Comparison of Environmental Impacts by Alternative (continued)**

Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5 Preferred Alternative	Alternative 6	No Action Alternative
<b>Wetlands</b>						
<b><u>NAS Jacksonville</u></b> No impact on wetlands.	<b><u>NAS Jacksonville</u></b> No impact on wetlands.	<b><u>NAS Jacksonville</u></b> No impact on wetlands.	<b><u>NAS Jacksonville</u></b> No impact on wetlands.	<b><u>NAS Jacksonville</u></b> No impact on wetlands.	<b><u>NAS Jacksonville</u></b> No impact on wetlands.	<b><u>NAS Jacksonville</u></b> No impact on wetlands.
<b><u>NAS Whidbey Island</u></b> Approximately 0.2 acres of wetlands filled.	<b><u>NAS Whidbey Island</u></b> Approximately 6.8 acres of wetlands filled.	<b><u>NAS Whidbey Island</u></b> Approximately 2.5 acres of wetlands filled.	<b><u>NAS Whidbey Island</u></b> Approximately 6.7 acres of wetlands filled.	<b><u>NAS Whidbey Island</u></b> Approximately 0.2 acres of wetlands filled.	<b><u>NAS Whidbey Island</u></b> Approximately 2.1 acres of wetlands filled.	<b><u>NAS Whidbey Island</u></b> No impact on wetlands.
<b><u>MCBH Kaneohe Bay</u></b> No impact on wetlands.	<b><u>MCBH Kaneohe Bay</u></b> No impact on wetlands.	<b><u>MCBH Kaneohe Bay</u></b> No impact on wetlands.	<b><u>MCBH Kaneohe Bay</u></b> No impact on wetlands.	<b><u>MCBH Kaneohe Bay</u></b> No impact on wetlands.	<b><u>MCBH Kaneohe Bay</u></b> No impact on wetlands.	<b><u>MCBH Kaneohe Bay</u></b> No impact on wetlands.
<b><u>NAS North Island</u></b> No impact on wetlands.	<b><u>NAS North Island</u></b> No impact on wetlands.	<b><u>NAS North Island</u></b> No impact on wetlands.	<b><u>NAS North Island</u></b> No impact on wetlands.	<b><u>NAS North Island</u></b> No impact on wetlands.	<b><u>NAS North Island</u></b> No impact on wetlands.	<b><u>NAS North Island</u></b> No impact on wetlands.
<b>Biological Resources (vegetation, wildlife, marine mammals)</b>						
<b><u>NAS Jacksonville</u></b> Permanent loss of approximately 4 acres of maintained lawn; less than 1 acre of pine stand potentially removed; no adverse effects on wildlife and no reasonably foreseeable takes of marine mammal species.	<b><u>NAS Jacksonville</u></b> Permanent loss of approximately 4 acres of maintained lawn; less than 1 acre of pine stand potentially removed; no adverse effects on wildlife and no reasonably foreseeable takes of marine mammal species.	<b><u>NAS Jacksonville</u></b> Permanent loss of approximately 4 acres of maintained lawn; less than 1 acre of pine stand potentially removed; no adverse effects on wildlife and no reasonably foreseeable takes of marine mammal species.	<b><u>NAS Jacksonville</u></b> Permanent loss of approximately 2 acres of maintained lawn; no adverse effects on wildlife and no reasonably foreseeable takes of marine mammal species.	<b><u>NAS Jacksonville</u></b> Permanent loss of approximately 4 acres of maintained lawn; less than 1 acre of pine stand potentially removed; no adverse effects on wildlife and no reasonably foreseeable takes of marine mammal species.	<b><u>NAS Jacksonville</u></b> Permanent loss of approximately 2 acres of maintained lawn; no adverse effects on wildlife and no reasonably foreseeable takes of marine mammal species.	<b><u>NAS Jacksonville</u></b> No impact on vegetation, wildlife, or marine mammals.
<b><u>NAS Whidbey Island</u></b> Permanent loss of approximately 5.6 acres of herbaceous vegetation; negligible impacts on wildlife and no reasonably foreseeable takes of marine mammal species.	<b><u>NAS Whidbey Island</u></b> Permanent loss of approximately 32.6 acres of herbaceous vegetation; negligible impacts on wildlife and no reasonably foreseeable takes of marine mammal species.	<b><u>NAS Whidbey Island</u></b> Permanent loss of approximately 11.8 acres of herbaceous vegetation; negligible impacts on wildlife and no reasonably foreseeable takes of marine mammal species.	<b><u>NAS Whidbey Island</u></b> Permanent loss of approximately 32.5 acres of herbaceous vegetation; negligible impacts on wildlife and no reasonably foreseeable takes of marine mammal species.	<b><u>NAS Whidbey Island</u></b> Permanent loss of approximately 5.6 acres of herbaceous vegetation; negligible impacts on wildlife and no reasonably foreseeable takes of marine mammal species.	<b><u>NAS Whidbey Island</u></b> Permanent loss of approximately 21.6 acres of herbaceous vegetation; negligible impacts on wildlife; and no reasonably foreseeable takes of marine mammal species.	<b><u>NAS Whidbey Island</u></b> No impact on vegetation, wildlife, or marine mammals.

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**Table 2-7 Comparison of Environmental Impacts by Alternative (continued)**

Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5 Preferred Alternative	Alternative 6	No Action Alternative
<b><u>MCBH Kaneohe Bay</u></b> Permanent loss of approximately 2 acres of Bermuda grass; minor impacts on vegetation; negligible impacts on wildlife; and no reasonably foreseeable takes of marine mammal species.	<b><u>MCBH Kaneohe Bay</u></b> No impacts on vegetation. Negligible impacts on wildlife and no reasonably foreseeable takes of marine mammal species.	<b><u>MCBH Kaneohe Bay</u></b> Permanent loss of approximately 0.5 acres of Bermuda grass; minor impacts on vegetation; negligible impacts on wildlife; and no reasonably foreseeable takes of marine mammal species.	<b><u>MCBH Kaneohe Bay</u></b> Permanent loss of approximately 0.5 acres of Bermuda grass; minor impacts on vegetation; negligible impacts on wildlife; and no reasonably foreseeable takes of marine mammal species.	<b><u>MCBH Kaneohe Bay</u></b> Permanent loss of approximately 2 acres of Bermuda grass; minor impacts on vegetation; negligible impacts on wildlife; and no reasonably foreseeable takes of marine mammal species.	<b><u>MCBH Kaneohe Bay</u></b> Permanent loss of approximately 2 acres of Bermuda grass; minor impacts on vegetation; negligible impacts on wildlife; and no reasonably foreseeable takes of marine mammal species.	<b><u>MCBH Kaneohe Bay</u></b> No impact on vegetation; wildlife; or marine mammals.
<b><u>NAS North Island</u></b> No impact on vegetation and wildlife. No reasonably foreseeable takes of marine mammal species.	<b><u>NAS North Island</u></b> No impact on vegetation and wildlife. No reasonably foreseeable takes of marine mammal species.	<b><u>NAS North Island</u></b> No impact on vegetation and wildlife. No reasonably foreseeable takes of marine mammal species.	<b><u>NAS North Island</u></b> No impact on vegetation and wildlife. No reasonably foreseeable takes of marine mammal species.	<b><u>NAS North Island</u></b> No impact on vegetation and wildlife. No reasonably foreseeable takes of marine mammal species.	<b><u>NAS North Island</u></b> No impact on vegetation and wildlife. No reasonably foreseeable takes of marine mammal species.	<b><u>NAS North Island</u></b> No impact on vegetation, wildlife, or marine mammals.
<b>Threatened and Endangered Species</b>						
<b><u>NAS Jacksonville</u></b> No effect on threatened or endangered species.	<b><u>NAS Jacksonville</u></b> No effect on threatened or endangered species.	<b><u>NAS Jacksonville</u></b> No effect on threatened or endangered species.	<b><u>NAS Jacksonville</u></b> No effect on threatened or endangered species.	<b><u>NAS Jacksonville</u></b> No effect on threatened or endangered species.	<b><u>NAS Jacksonville</u></b> No effect on threatened or endangered species.	<b><u>NAS Jacksonville</u></b> No effect on threatened or endangered species.
<b><u>NAS Whidbey Island</u></b> No effect on humpback whale, southern resident killer whale, the Steller sea lion, leatherback sea turtle. May affect, but is not likely to adversely affect, marbled murrelet, Puget Sound chinook salmon, Puget Sound steelhead, and bull trout or their respective designated critical habitats.	<b><u>NAS Whidbey Island</u></b> No effect on humpback whale, southern resident killer whale, the Steller sea lion, leatherback sea turtle. May affect, but is not likely to adversely affect, marbled murrelet, Puget Sound chinook salmon, Puget Sound steelhead, and bull trout or their respective designated critical habitats.	<b><u>NAS Whidbey Island</u></b> No effect on humpback whale, southern resident killer whale, the Steller sea lion, leatherback sea turtle. May affect, but is not likely to adversely affect, marbled murrelet, Puget Sound chinook salmon, Puget Sound steelhead, and bull trout or their respective designated critical habitats.	<b><u>NAS Whidbey Island</u></b> No effect on humpback whale, southern resident killer whale, the Steller sea lion, leatherback sea turtle. May affect, but is not likely to adversely affect, marbled murrelet, Puget Sound chinook salmon, Puget Sound steelhead, and bull trout or their respective designated critical habitats.	<b><u>NAS Whidbey Island</u></b> No effect on humpback whale, southern resident killer whale, the Steller sea lion, leatherback sea turtle. May affect, but is not likely to adversely affect, marbled murrelet, Puget Sound chinook salmon, Puget Sound steelhead, and bull trout or their respective designated critical habitats.	<b><u>NAS Whidbey Island</u></b> No effect on humpback whale, southern resident killer whale, the Steller sea lion, leatherback sea turtle. May affect, but is not likely to adversely affect, marbled murrelet, Puget Sound chinook salmon, Puget Sound steelhead, and bull trout or their respective designated critical habitats.	<b><u>NAS Whidbey Island</u></b> No effect on threatened or endangered species.

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**Table 2-7 Comparison of Environmental Impacts by Alternative (continued)**

Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5 Preferred Alternative	Alternative 6	No Action Alternative
<p><b><u>MCBH Kaneohe Bay</u></b> May affect, but is not likely to adversely affect, the Hawaiian monk seal, humpback whale, sperm whale, Newell's shearwater, green sea turtle, and hawksbill sea turtle.</p> <p>No effect on the Hawaiian Hoary Bat, Hawaiian stilt, Hawaiian Common Moorhen, Hawaiian Coot, Hawaiian Duck, Round-leaved Chaff-Flower, Puukaa, White Hibiscus, Yellow Hibiscus, Loulu Palm, and Ohai.</p>	<p><b><u>MCBH Kaneohe Bay</u></b> May affect, but is not likely to adversely affect, the Hawaiian monk seal, humpback whale, sperm whale, Newell's shearwater, green sea turtle, and hawksbill sea turtle.</p> <p>No effect on the Hawaiian Hoary Bat, Hawaiian stilt, Hawaiian Common Moorhen, Hawaiian Coot, Hawaiian Duck, Round-leaved Chaff-Flower, Puukaa, White Hibiscus, Yellow Hibiscus, Loulu Palm, and Ohai.</p>	<p><b><u>MCBH Kaneohe Bay</u></b> May affect, but is not likely to adversely affect, the Hawaiian monk seal, humpback whale, sperm whale, Newell's shearwater, green sea turtle, and hawksbill sea turtle.</p> <p>No effect on the Hawaiian Hoary Bat, Hawaiian stilt, Hawaiian Common Moorhen, Hawaiian Coot, Hawaiian Duck, Round-leaved Chaff-Flower, Puukaa, White Hibiscus, Yellow Hibiscus, Loulu Palm, and Ohai.</p>	<p><b><u>MCBH Kaneohe Bay</u></b> May affect, but is not likely to adversely affect, the Hawaiian monk seal, humpback whale, sperm whale, Newell's shearwater, green sea turtle, and hawksbill sea turtle.</p> <p>No effect on the Hawaiian Hoary Bat, Hawaiian stilt, Hawaiian Common Moorhen, Hawaiian Coot, Hawaiian Duck, Round-leaved Chaff-Flower, Puukaa, White Hibiscus, Yellow Hibiscus, Loulu Palm, and Ohai.</p>	<p><b><u>MCBH Kaneohe Bay</u></b> May affect, but is not likely to adversely affect, the Hawaiian monk seal, humpback whale, sperm whale, Newell's shearwater, green sea turtle, and hawksbill sea turtle.</p> <p>No effect on the Hawaiian Hoary Bat, Hawaiian stilt, Hawaiian Common Moorhen, Hawaiian Coot, Hawaiian Duck, Round-leaved Chaff-Flower, Puukaa, White Hibiscus, Yellow Hibiscus, Loulu Palm, and Ohai.</p>	<p><b><u>MCBH Kaneohe Bay</u></b> May affect, but is not likely to adversely affect, the Hawaiian monk seal, humpback whale, sperm whale, Newell's shearwater, green sea turtle, and hawksbill sea turtle.</p> <p>No effect on the Hawaiian Hoary Bat, Hawaiian stilt, Hawaiian Common Moorhen, Hawaiian Coot, Hawaiian Duck, Round-leaved Chaff-Flower, Puukaa, White Hibiscus, Yellow Hibiscus, Loulu Palm, and Ohai.</p>	<p><b><u>MCBH Kaneohe Bay</u></b> No effect on threatened or endangered species.</p>
<p><b><u>NAS North Island</u></b> No effect on threatened or endangered species.</p>	<p><b><u>NAS North Island</u></b> No effect on threatened or endangered species.</p>	<p><b><u>NAS North Island</u></b> No effect on threatened or endangered species.</p>	<p><b><u>NAS North Island</u></b> No effect on threatened or endangered species.</p>	<p><b><u>NAS North Island</u></b> No effect on threatened or endangered species.</p>	<p><b><u>NAS North Island</u></b> No effect on threatened or endangered species.</p>	<p><b><u>NAS North Island</u></b> No effect on threatened or endangered species.</p>
<b>Cultural Resources</b>						
<p><b><u>NAS Jacksonville</u></b> No effect on architectural or archaeological resources.</p>	<p><b><u>NAS Jacksonville</u></b> No effect on architectural or archaeological resources.</p>	<p><b><u>NAS Jacksonville</u></b> No effect on architectural or archaeological resources.</p>	<p><b><u>NAS Jacksonville</u></b> No effect on architectural or archaeological resources.</p>	<p><b><u>NAS Jacksonville</u></b> No effect on architectural or archaeological resources.</p>	<p><b><u>NAS Jacksonville</u></b> No effect on architectural or archaeological resources.</p>	<p><b><u>NAS Jacksonville</u></b> No effect on architectural or archaeological resources.</p>
<p><b><u>NAS Whidbey Island</u></b> A Phase 1 archaeological survey has been conducted. The Navy has initiated NHPA Section 106 consultation with the Washington SHPO and based on any findings will work with the SHPO to mitigate effects.</p>	<p><b><u>NAS Whidbey Island</u></b> A Phase 1 archaeological survey has been conducted. The Navy has initiated NHPA Section 106 consultation with the Washington SHPO and, based on any findings, will work with the SHPO to mitigate effects.</p>	<p><b><u>NAS Whidbey Island</u></b> A Phase 1 archaeological survey has been conducted. The Navy has initiated NHPA Section 106 consultation with the Washington SHPO and, based on any findings, will work with the SHPO to mitigate effects.</p>	<p><b><u>NAS Whidbey Island</u></b> A Phase 1 archaeological survey has been conducted. The Navy has initiated NHPA Section 106 consultation with the Washington SHPO and, based on any findings, will work with the SHPO to mitigate effects.</p>	<p><b><u>NAS Whidbey Island</u></b> A Phase 1 archaeological survey has been conducted. The Navy has initiated NHPA Section 106 consultation with the Washington SHPO and, based on any findings, will work with the SHPO to mitigate effects.</p>	<p><b><u>NAS Whidbey Island</u></b> A Phase 1 archaeological survey has been conducted. The Navy has initiated NHPA Section 106 consultation with the Washington SHPO and, based on any findings, will work with the SHPO to mitigate effects.</p>	<p><b><u>NAS Whidbey Island</u></b> No effect on architectural or archaeological resources.</p>

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**Table 2-7 Comparison of Environmental Impacts by Alternative (continued)**

Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5 Preferred Alternative	Alternative 6	No Action Alternative
<b><u>MCBH Kaneohe Bay</u></b> No adverse effect on architectural resources. Consultation under Section 106 of the NHPA for architectural and archaeological resources was initiated in a letter dated August 30, 2007. A follow-up letter detailing new project siting layouts was submitted on September 11, 2008. The Navy will continue to consult with the Hawaii SHPO to mitigate any potential effects.	<b><u>MCBH Kaneohe Bay</u></b> No adverse effect on architectural resources. Consultation under Section 106 of the NHPA for architectural and archaeological resources was initiated in a letter dated August 30, 2007. A follow-up letter detailing new project siting layouts was submitted on September 11, 2008. The Navy will continue to consult with the Hawaii SHPO to mitigate any potential effects.	<b><u>MCBH Kaneohe Bay</u></b> No adverse effect on architectural resources. Consultation under Section 106 of the NHPA for architectural and archaeological resources was initiated in a letter dated August 30, 2007. A follow-up letter detailing new project siting layouts was submitted on September 11, 2008. The Navy will continue to consult with the Hawaii SHPO to mitigate any potential effects.	<b><u>MCBH Kaneohe Bay</u></b> No adverse effect on architectural resources. Consultation under Section 106 of the NHPA for architectural and archaeological resources was initiated in a letter dated August 30, 2007. A follow-up letter detailing new project siting layouts was submitted on September 11, 2008. The Navy will continue to consult with the Hawaii SHPO to mitigate any potential effects.	<b><u>MCBH Kaneohe Bay</u></b> No adverse effect on architectural resources. Consultation under Section 106 of the NHPA for architectural and archaeological resources was initiated in a letter dated August 30, 2007. A follow-up letter detailing new project siting layouts was submitted on September 11, 2008. The Navy will continue to consult with the Hawaii SHPO to mitigate any potential effects.	<b><u>MCBH Kaneohe Bay</u></b> No adverse effect on architectural resources. Consultation under Section 106 of the NHPA for architectural and archaeological resources was initiated in a letter dated August 30, 2007. A follow-up letter detailing new project siting layouts was submitted on September 11, 2008. The Navy will continue to consult with the Hawaii SHPO to mitigate any potential effects.	<b><u>MCBH Kaneohe Bay</u></b> No adverse effect on architectural resources. Consultation under Section 106 of the NHPA for architectural and archaeological resources was initiated in a letter dated August 30, 2007. A follow-up letter detailing new project siting layouts was submitted on September 11, 2008. The Navy will continue to consult with the Hawaii SHPO to mitigate any potential effects.
<b><u>NAS North Island</u></b> No effect on architectural or archaeological resources.	<b><u>NAS North Island</u></b> No effect on architectural or archaeological resources.	<b><u>NAS North Island</u></b> No effect on architectural or archaeological resources.	<b><u>NAS North Island</u></b> No effect on architectural or archaeological resources.	<b><u>NAS North Island</u></b> No effect on architectural or archaeological resources.	<b><u>NAS North Island</u></b> No effect on architectural or archaeological resources.	<b><u>NAS North Island</u></b> No effect on architectural or archaeological resources.
<b>Hazardous Materials and Waste Management</b>						
<b><u>NAS Jacksonville</u></b> No additional hazardous materials, and/or waste streams that cannot be managed by existing functions and facilities	<b><u>NAS Jacksonville</u></b> No additional hazardous materials, and/or waste streams that cannot be managed by existing functions and facilities	<b><u>NAS Jacksonville</u></b> No additional hazardous materials, and/or waste streams that cannot be managed by existing functions and facilities	<b><u>NAS Jacksonville</u></b> No additional hazardous materials, and/or waste streams that cannot be managed by existing functions and facilities	<b><u>NAS Jacksonville</u></b> No additional hazardous materials, and/or waste streams that cannot be managed by existing functions and facilities	<b><u>NAS Jacksonville</u></b> No additional hazardous materials, and/or waste streams that cannot be managed by existing functions and facilities	<b><u>NAS Jacksonville</u></b> No impact on hazardous materials generation.
<b><u>NAS Whidbey Island</u></b> No additional hazardous materials and/or waste streams that cannot be managed by existing functions and facilities	<b><u>NAS Whidbey Island</u></b> No additional hazardous materials and/or waste streams that cannot be managed by existing functions and facilities	<b><u>NAS Whidbey Island</u></b> No additional hazardous materials and/or waste streams that cannot be managed by existing functions and facilities	<b><u>NAS Whidbey Island</u></b> No additional hazardous materials and/or waste streams that cannot be managed by existing functions and facilities	<b><u>NAS Whidbey Island</u></b> No additional hazardous materials and/or waste streams that cannot be managed by existing functions and facilities	<b><u>NAS Whidbey Island</u></b> No additional hazardous materials and/or waste streams that cannot be managed by existing functions and facilities	<b><u>NAS Whidbey Island</u></b> No impact on hazardous materials generation.

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**Table 2-7 Comparison of Environmental Impacts by Alternative (continued)**

<b>Alternative 1</b>	<b>Alternative 2</b>	<b>Alternative 3</b>	<b>Alternative 4</b>	<b>Alternative 5 Preferred Alternative</b>	<b>Alternative 6</b>	<b>No Action Alternative</b>
<b><u>MCBH Kaneohe Bay</u></b> No additional hazardous materials and/or waste streams that cannot be managed by existing functions and facilities	<b><u>MCBH Kaneohe Bay</u></b> No additional hazardous materials and/or waste streams that cannot be managed by existing functions and facilities	<b><u>MCBH Kaneohe Bay</u></b> No additional hazardous materials and/or waste streams that cannot be managed by existing functions and facilities	<b><u>MCBH Kaneohe Bay</u></b> No additional hazardous materials and/or waste streams that cannot be managed by existing functions and facilities	<b><u>MCBH Kaneohe Bay</u></b> No additional hazardous materials and/or waste streams that cannot be managed by existing functions and facilities	<b><u>MCBH Kaneohe Bay</u></b> No additional hazardous materials and/or waste streams that cannot be managed by existing functions and facilities	<b><u>MCBH Kaneohe Bay</u></b> No impact on hazardous materials generation.
<b><u>NAS North Island</u></b> No impact on hazardous materials generation.	<b><u>NAS North Island</u></b> No impact on hazardous materials generation.	<b><u>NAS North Island</u></b> No impact on hazardous materials generation.	<b><u>NAS North Island</u></b> No impact on hazardous materials generation.	<b><u>NAS North Island</u></b> No impact on hazardous materials generation.	<b><u>NAS North Island</u></b> No impact on hazardous materials generation.	<b><u>NAS North Island</u></b> No impact on hazardous materials generation.

Note:

<sup>1</sup> The environmental justice analysis was completed for each base using the alternative that included the most land off-station, which is considered the “worst case” scenario for impacts from noise. See the individual subsections that discuss environmental justice in each section for a more detailed explanation.

### **3 Existing Environment: NAS Jacksonville**

#### **Introduction**

NAS Jacksonville is located in the southeastern portion of Duval County, Florida, along the west bank of the St. Johns River, approximately 15 miles inland of the Atlantic Ocean in the city of Jacksonville, Florida.

The existing environment for each relevant environmental resource is described herein to provide the public and agency decision makers with a meaningful point from which to compare potential future environmental, social, and economic effects of the proposed action and alternative actions. The environmental impacts on each resource are discussed in Section 4, Environmental Consequences: NAS Jacksonville, and include a consideration of the direct and indirect effects of the proposed action (see Section 2, Proposed Action and Alternatives), including the No Action Alternative. Cumulative effects are described in Section 11.

This section contains a description of the environment that could be affected by the replacement of the P-3C aircraft with P-8A MMA at NAS Jacksonville. The Council on Environmental Quality (CEQ) regulations implementing the National Environmental Policy Act (NEPA) of 1969 require an EIS to “succinctly describe the environment of the area to be affected or created by the alternatives under consideration” (40 Code of Federal Regulations [CFR] 1502.15). In accordance with the guidance, the descriptions of the existing environmental resources that could be affected by implementation of the proposed action and its alternatives need be no longer than necessary. Consistent with this guidance, Navy policy (OPNAVINST 5090.1C) directs that the EIS should exclude material not directly applicable to the expected impact. Therefore, the discussion of the existing environment focuses on those resource areas where there is a potential for significant impact.

Under the replacement alternatives for NAS Jacksonville, the existing environment may be affected by the following components of the proposed action:

- Aircraft operations;
- New construction and renovation; and
- Personnel relocation or transition.

Accordingly, the discussion of the existing environment in the vicinity of NAS Jacksonville focuses on airfield operations, noise, land use, air quality, socioeconomics, topography and soils, biological resources, and environmental management practices. In contrast, since the number of personnel stationed or employed at NAS Jacksonville would decrease under all alternatives, the following existing environmental resources are not addressed in detail in this EIS because implementation of the proposed action and its alternatives would have a negligible effect or no effect on them:

**Infrastructure and Utilities.** The personnel decrease at NAS Jacksonville would result in a corresponding decrease in water use, wastewater discharge, power use, and solid waste generation and thus result in no increases in demand and no effect on the capacity of existing infrastructure and utilities.

**Community Services.** Existing community services, including fire protection, emergency, security, and medical services would not change under any of the basing alternatives for NAS Jacksonville or the surrounding communities because fewer personnel and their families would require these services.

**Transportation.** There would be a corresponding decrease in privately owned vehicles, traffic, and the miles traveled under all of the proposed alternatives. Thus, no additional congestion or traffic or transportation requirements on or around the base are anticipated.

### **3.1 Airfield Operations**

Aircraft activities at NAS Jacksonville include both fixed- and rotary-wing operations. NAS Jacksonville serves as host to several air wings and tenants, including Patrol and Reconnaissance Wing Eleven; the Helicopter Maritime Strike Wing Atlantic Detachment; Patrol Squadron (VP)-30; and the U.S. Customs Service and their fleet of Cessna 210, HU-500, PA-42, and AS350 aircraft. Aircraft activity at NAS Jacksonville has historically been dominated by the P-3C aircraft, operated by Patrol and Reconnaissance Wing Eleven, VP-30, and a P-3C Update<sup>1</sup> squadron. The Helicopter Maritime Strike Wing Atlantic Detachment operates SH-60 and MH-60R rotary-wing aircraft. In addition to the above, the air station is also used by the Fleet Readiness

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<sup>1</sup> The P-3C Update aircraft are not part of the P-8A MMA replacement action.



ness Center Jacksonville and transient aircraft, including the F/A-18 Hornet, the AV-8 Harrier, and the T-2 Buckeye.

The airfield at NAS Jacksonville (John Towers Field) consists of two intersecting runways, Runway 09/27 and Runway 14/32. Runway 09/27 is a Class B Runway, 8,000 feet long, and is the primary runway for military fixed-wing aircraft. Runway 14/32 is a Class A runway, 5,977 feet long, and is frequently used for pattern work by helicopters. John Towers Field is open 7 days per week, 24 hours per day. The local flying area for the Air Station is within a 350-nautical mile (NM) radius of the Navy Jacksonville Tactical Air Navigation (TACAN) (NAS Jacksonville Instruction 3710.1T). In addition to John Towers Field, training operations also occur at outlying landing field (OLF) Whitehouse. The OLF is located approximately 14 miles northwest of NAS Jacksonville and is typically used by F/A-18, T-2C, T-45, EA-6B, H-60, and S-3A/B aircraft. Facilities consist of a single runway (Runway 11/29) and simulated carrier deck approach lighting. There is no approach radar. Runway 11/29's useable surface is 8,000 feet long and 150 feet wide.

Under the National Airspace System, the airspace above John Towers Field is designated as Class D airspace. Class D airspace at NAS Jacksonville is defined as that airspace below 2,600 feet above mean sea level (amsl) within a 5.3-NM radius of an air station. Air traffic control services to all aircraft operating within it are provided by the NAS Jacksonville Control Tower. Jacksonville Terminal Radar Approach Control, located at Jacksonville International Airport, provides approach control service for both John Towers Field and OLF Whitehouse within the airspace delegated by the Jacksonville Air Route Traffic Control Center.

Aircraft flying patterns approaching or departing from John Towers Field normally fly specific routes, i.e., flight tracks. Flight tracks are represented as single lines on maps and other graphics and depict the average route of the aircraft over the ground. These tracks are affected by aircraft performance, pilot technique, other air traffic, and weather conditions such that the actual flight path (track) is a band rather than a single line, as depicted on the maps. Flight tracks associated with John Towers Field are illustrated in Figure 3-1.

Projected annual flight operations (i.e., any takeoff or landing) at John Towers Field for the year 2011 are presented in Table 3-1. The takeoff and landing may be part of a training maneuver (or pattern) associated with the air station runway or may be associated with a departure or arrival of an aircraft to or from the station.

Operations of P-3C aircraft currently account for more than 75% of the total annual airfield operations. Operations of the SH-60 helicopter account for 14% of total annual airfield operations. Together these two aircraft account for the vast majority of all operations. It should also be noted that about 4% (4,004 operations) of current total annual operations occur between 10:00 p.m. and 7:00 a.m.

**Table 3-1 Baseline Modeled Annual Operations at NAS Jacksonville (2011)**

	Day	Night	Total
	(7:00 a.m. to 10:00 p.m.)	(10:00 p.m. to 7:00 a.m.)	
P-3C			
Departure	4,123	125	4,248
Straight-in Arrivals	4,123	125	4,248
Overhead Arrival	110	3	113
Touch-and-Go	50,496	1,500	51,996
GCA Pattern	10,099	200	10,299
Total	68,951	1,953	70,904
P-3C Update <sup>1</sup>			
Departure	123	10	133
Straight-in Arrivals	123	10	133
Overhead Arrival	0	0	0
Touch-and-Go	1,952	0	1,952
GCA Pattern	390	0	390
Total	2,588	20	2,608
SH-60			
Departure	4,500	150	4,650
Straight-in Arrivals	4,500	150	4,650
Overhead Arrival	0	0	0
Touch-and-Go	410	12	422
GCA Pattern	4,122	128	4,250
Total	13,532	440	13,972
C-172			
Departure	110	35	145
Straight-in Arrivals	110	35	145
Overhead Arrival	0	0	0
Touch-and-Go	32	0	32
GCA Pattern	0	0	0
Total	252	70	322
PA-42			
Departure	550	55	605
Straight-in Arrivals	550	55	605
Overhead Arrival	0	0	0
Touch-and-Go	48	2	50

**Table 3-1 Baseline Modeled Annual Operations at NAS Jacksonville (2011)  
(continued)**

	Day	Night	Total
	(7:00 a.m. to 10:00 p.m.)	(10:00 p.m. to 7:00 a.m.)	
GCA Pattern	0	0	0
<b>Total</b>	<b>1,148</b>	<b>112</b>	<b>1,260</b>
<b>Other Aircraft<sup>2</sup></b>			
Departure	2,225	78	2,303
Straight-in Arrivals	1,140	42	1,182
Overhead Arrival	1,085	36	1,121
Touch-and-Go	964	30	994
GCA Pattern	1,534	48	1,582
<b>Total</b>	<b>6,948</b>	<b>234</b>	<b>7,182</b>
<b>Summary – Airfield Total</b>			
Departures	11,631	528	12,159
Straight-in Arrivals	10,546	489	11,035
Overhead Arrival	1,195	39	1,234
Touch-and-Go	53,902	2,506	56,408
GCA Pattern	16,145	442	16,587
<b>Airfield Total</b>	<b>93,419</b>	<b>4,004</b>	<b>97,423</b>

Source: Wyle Laboratories, Inc. July 2008 (see Appendix F).

Note:

<sup>1</sup> The P-3C Update aircraft are not part of the P-8A MMA replacement action.

<sup>2</sup> Other aircraft include B-737, B-747, BE-20, C-5, C-9, C-17, C-40, C-130, E-2/C-2, EA-6, F-15, F-16, F-18, PC-9, T-34, T-45, and T-38.

Key:

GCA = Ground control approach.

### 3.2 Noise

Flight operations are the primary source of noise generated at NAS Jacksonville. Flight operations at NAS Jacksonville have historically been dominated by the P-3C (see Table 3-1), which accounts for about 49% of the acoustical energy in the noise environment at NAS Jacksonville (see Figure 3-2). The other primary noise emitters at the installation are the F/A-18 and SH-60, which contribute approximately 26% and 13% respectively (Wyle Laboratories, Inc. July 2008).

Engine maintenance run-ups are a significant source of noise at air stations. In-frame and out-of-frame engine maintenance run-ups are used to test the engine at various power settings and durations. In-frame engine maintenance run-ups are typically conducted on outdoor test pads. At NAS Jacksonville, engine maintenance run-ups are conducted in an enclosed structure, either in the engine test cell (Building 873) for out-of-frame testing or the hush house (Building

777) for in-frame testing. P-3C out-of-frame engine testing is also conducted at test stands located on the northeast boundary of the station. Pre-flight engine run-ups are generally not conducted for the types of aircraft stationed at NAS Jacksonville. Noise exposure is typically calculated using the day-night average sound level (DNL). The DNL noise metric is based on the number of operations that occur on an average annual day or average busy day over a 24-hour period. The DNL metric includes a 10 decibel (dB) penalty for nighttime operations (10:00 p.m. to 7:00 a.m.) because people are more sensitive to noise during normal sleeping hours, when ambient noise levels are lower. The DNL has been determined to be a reliable measure of community annoyance with aircraft noise and has become the standard metric used by many federal and state governmental agencies and organizations in the United States, such as the U.S. Environmental Protection Agency (EPA) and the Federal Aviation Administration (FAA), for assessing aircraft noise.

The DNL for the community is depicted as a series of contours that connect points of equal value, usually in 5-dB increments. Calculated noise contours do not represent exact scientific measurements. The area between two specific contours is known as a noise zone. The noise zones used in this study are:

- Less than 65 dB DNL;
- 65 to < 70 dB DNL;
- 70 to < 75 dB DNL; and
- Greater than 75 dB DNL.

Individual response to noise levels varies and is influenced by many factors, including:

- The activity the individual is engaged in at the time of the noise;
- General sensitivity to noise;
- Time of day;
- Length of time an individual is exposed to a noise;
- Predictability of noise; and
- Average temperature.

A small change in dBA (A-weighted decibels) would not generally be noticeable. As the change in dBA increases, individual perception is greater, as shown in Table 3-2.

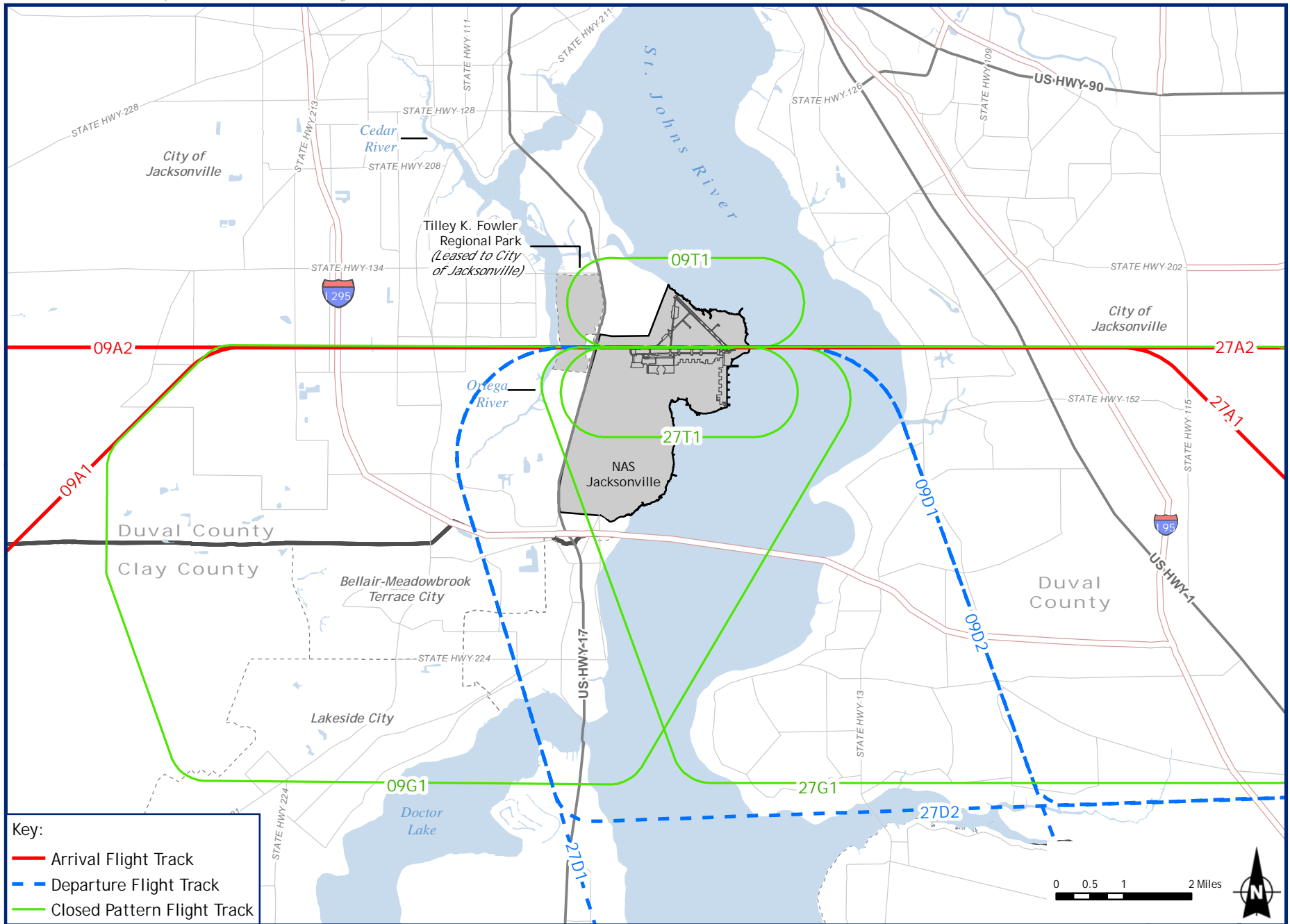
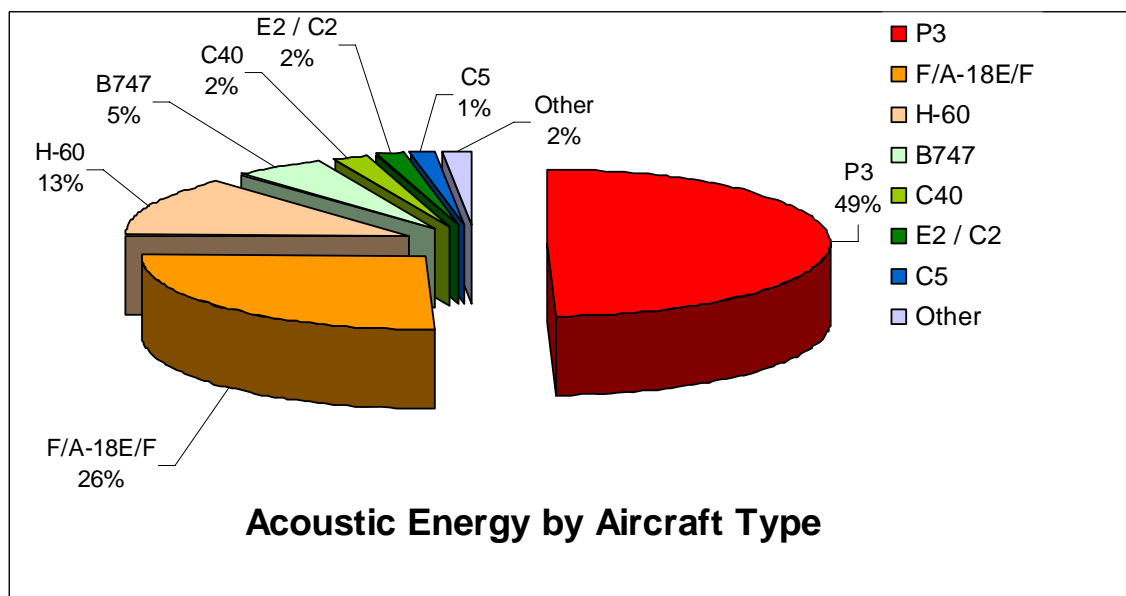


Figure 3-1  
 P-3C Flight Tracks at NAS Jacksonville  
 Jacksonville, Florida



Source: Wyle Laboratories July 2008.

**Figure 3-2 Acoustic Energy by Aircraft Type at NAS Jacksonville**

**Table 3-2 Subjective Responses to Changes in A-Weighted Decibels**

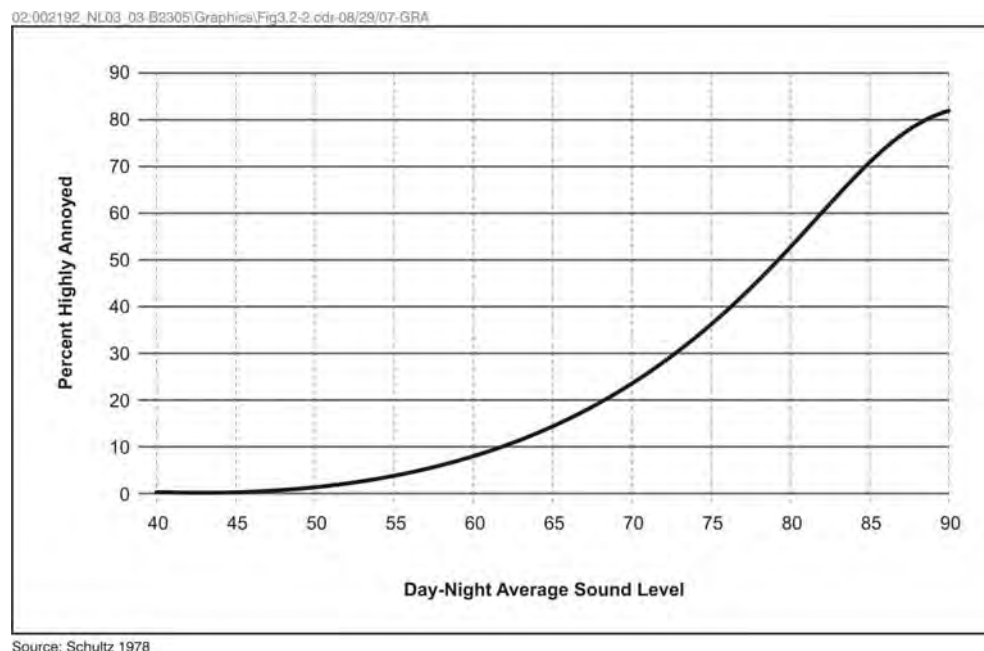
Change	Change in Perceived Loudness
1 dB	Requires close attention to notice
3 dB	Barely perceptible
5 dB	Quite noticeable
10 dB	Dramatic-twice or half as loud
20 dB	Striking – fourfold change

Source: Wyle Laboratories, Inc. October 2004.

However, on a group or community level, various studies and surveys have shown a correlation between DNL and the percentage of people who consider themselves “highly annoyed.” This correlation is shown on Figure 3-3. This curve, which was originally developed in the 1970s and has been updated over the last 10 years, remains the best available method to estimate community response to aircraft noise. A discussion of the compatibility of land uses within the noise zones is included in Section 3.3.4.

The sound exposure level (SEL) is a composite metric that represents both the intensity of a sound and its duration. Individual time-varying noise events (e.g., aircraft overflights) have two main characteristics: a sound level that changes throughout the event and a period of time during which the event is heard. The SEL provides a measure of the net impact of the entire acoustic event, but it does not directly represent the sound level heard at any given time. During

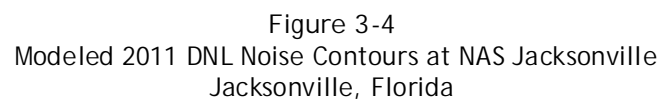
an aircraft flyover, the SEL would include both the maximum noise level and the lower noise levels produced during onset and recess periods of the overflight.



**Figure 3-3 Influence of Sound Level on Annoyance**

The SEL is a logarithmic measure of the total acoustic energy transmitted to the listener during the event. Mathematically, it represents the level of a constant sound that would, in one second, generate the same acoustic energy as the actual time-varying noise event. For sound from aircraft overflights, which typically lasts more than one second, the SEL is usually greater than the maximum sound level ( $L_{\max}$ ) because an individual overflight takes seconds and the  $L_{\max}$  occurs instantaneously. The SEL represents the best metric to compare noise levels from overflights (Wyle Laboratories, Inc. July 2008).

The noise zones representing the baseline 2011 environment for NAS Jacksonville (see Figure 3-4) were developed using estimated average annual airfield operations (see Table 3-1) and average annual engine maintenance run-ups (Wyle Laboratories, Inc. July 2008). These modeled contours represent a net decrease in modeled noise when compared with the current air installations compatible use zones (AICUZ) noise study for NAS Jacksonville due to a difference in modeled projected aircraft operations in 2011. The off-station area, exclusive of water, and the estimated population within the modeled baseline 2011 noise zones for NAS Jacksonville are shown in Table 3-3. The population shown is a proportion of the 2000 census block based on the





geographic area of the noise zone projected to 2011, using the city of Jacksonville population growth rate to 2011 of 21%. Generally, the vast majority of the NAS Jacksonville baseline noise zones lie over the waters of the St. Johns River and the NAS Jacksonville base property. The remainders of the baseline noise zones are dominated by parcels zoned as recreational (park), commercial, and industrial, with very few residential land uses and very limited potential for increases in the density of population.

**Table 3-3 Off-Station Area (Excluding Water)<sup>1</sup> and Estimated Population within Modeled Baseline 2011 Noise Zones for NAS Jacksonville**

Noise Zone (DNL)	Area (Acres)	Population
65 to < 70 dB	244	446
70 to < 75 dB	26	52
75 dB or greater	5	9
<b>Total</b>	<b>275</b>	<b>507</b>
<b>Population projection to 2011</b>		<b>615</b>

Source: Wyle Laboratories, Inc. July 2008 (see Appendix F).

Note:

<sup>1</sup> The area within the 65 dB DNL or greater noise zone does not include the area within the boundary of NAS Jacksonville or the portion of the noise zone that extends over the St. Johns River and Ortega River.

Key:

dB = Decibel.

DNL = Day-night average sound level.

All but five acres of the greater-than-75 dB DNL noise zone are contained within the NAS Jacksonville boundary. The 70 to <75 and the 65 to 70 dB DNL noise zones extend to the east over the St. Johns River and to the west over the Ortega River and predominantly undeveloped recreational open spaces. Some residential units are encumbered by the 65 to 70 dB DNL noise zone to the southwest of the station, resulting in the majority of the population (73%) residing within the baseline noise zones.

### **3.3 Land Use**

#### **3.3.1 NAS Jacksonville Land Use**

NAS Jacksonville occupies approximately 3,896 acres in the southeastern portion of Duval County, Florida, along the west bank of the St. Johns River and on the east and west sides of U.S. Highway 17 (see Figure 2-1 in Section 2, Proposed Action and Alternatives). The station is 15 miles inland of the Atlantic Ocean and lies 3 miles north of the Duval and Clay County line.

Approximately 2,922 acres (76%) of the station has been developed. Aircraft operations areas cover roughly 1,600 acres in the northern part of the station and consist of two intersecting runways, parking aprons, taxiways, and clear zones. Administrative and industrial facilities cover about 350 acres immediately south of the aircraft operations area. The portion of the station west of U.S. Highway 17 and next to the Ortega River is leased to the city of Jacksonville and is a public use area designated as the Tillie K. Fowler Regional Park (formerly Westside Regional Park). Part of the land was acquired by the federal government in 1976 to control development encroaching on the NAS Jacksonville AICUZ. The Defense Reutilization Marketing Office (DRMO) is located west of U.S. Highway 17.

The southern part of NAS Jacksonville is more sparsely developed, with a mixture of land uses: administrative, residential and community facilities, ordnance storage, recreation, open space, and natural areas. Residential and community facilities include bachelor housing, family housing, and commercial, medical, and utility facilities. Ordnance storage is located near the southern boundary of the station to ensure compliance with all explosive safety quantity distance (ESQD) requirements. The approximately 700 acres of undeveloped land on the base are primarily natural forestlands and open space areas.

### **3.3.2 Regional Land Use**

NAS Jacksonville is located in the suburban area of the city of Jacksonville. The central business district of Jacksonville is located about 9 miles north of the station.

Predominant land uses in the vicinity of NAS Jacksonville include:

- Residential development along the station's southern boundary. South of these residential uses, in northern Clay County, are a mix of residential, commercial/business, and industrial land uses.
- Undeveloped land and a mixture of recreation, light industrial, and business/office uses west of the station in the Yukon and Ortega Hills communities.
- Recreation and open space uses immediately northwest of the station. North and west of these land uses is a mixture of commercial and residential land.
- Residential development along the eastern shore of the St. Johns River.

### **3.3.3 Land-Use Controls**

Development within and around NAS Jacksonville is controlled, guided, or influenced by the following plans, programs, and policies:

- The Navy and Marine Corps Air Installations Compatible Use Zones (AICUZ) Program;
- The 2003 Regional Shore Infrastructure Plan (RSIP) Overview for the Jacksonville Fleet Concentration Area (FCA);
- The 2005 NAS Jacksonville Integrated Natural Resources Management Plan (INRMP);
- The City of Jacksonville 2010 Comprehensive Plan;
- The 2007 City of Jacksonville Zoning Code; and
- The Florida Coastal Management Program (FCMP).

### **AICUZ Program**

The AICUZ Program was established in the 1970s by the Department of Defense (DoD) to analyze operational training requirements and to address communities' concerns about aircraft noise and accident potential. The purpose of the AICUZ Program is to achieve compatibility between air installations and neighboring communities by:

- Protecting the health, safety, and welfare of civilians and military personnel by encouraging land use that is compatible with aircraft operations;
- Protecting Navy and Marine Corps installation investment by safeguarding the installation's operational capabilities;
- Reducing noise impacts caused by aircraft operations while meeting operational, training, and flight safety requirements; and
- Informing the public about the AICUZ Program and seeking cooperative efforts to minimize noise and potential aircraft accident impacts.

An AICUZ study analyzes aircraft noise, accident potential, land-use compatibility, and operational procedures and provides recommendations for compatible development near air installations. Federal, state, regional, and local governments are encouraged to adopt guidelines promoting compatible development. The AICUZ Program defines the noise zones and accident potential zones (APZs) that represent the area where land-use controls are needed to protect the health, safety, and welfare of those living near the installation and to preserve the military flying mission.

**Noise.** Under the AICUZ Program, noise zones are identified as the area between the calculated noise contours, based on the number of operations that occur on an average annual day or average busy day (see Section 3.2 above). For land-use planning purposes, the noise

zones are grouped into three noise zones. Noise Zone 1 (less than 65 dB DNL) is generally considered an area of low or no noise impact. Noise Zone 2 (65 dB to 75 dB DNL) is an area of increased impact where some land-use controls are required. Noise Zone 3 (more than 75 dB DNL) is the most affected area and requires the greatest degree of land-use control.

**APZs.** The number and type of airfield operations are also used as the basis for identifying APZs around an airfield. Although the likelihood of an aircraft mishap occurring is remote, the Navy identifies areas of accident potential to assist in land-use planning. APZs are areas where an aircraft mishap is most likely to occur and is delineated based on historical data and departure, arrival, and pattern flight tracks on and near airfield runways. The Navy recommends to local planning agencies that developments concentrating large numbers of people, such as apartments, churches, and schools, be constructed outside the APZs.

APZs include three restricted areas, with the areas nearest the runways having the most restrictions. These areas, the Clear Zone, APZ 1, and APZ 2, are configured as follows:

- **Clear Zone.** The Clear Zone extends 3,000 feet beyond the end of the runway; it measures 1,500 feet wide at the end of the runway and 2,284 feet wide at its outer edge.
- **APZ 1.** APZ 1 extends 5,000 feet beyond the Clear Zone, with a width of 3,000 feet at its outer edge. APZ 1 is typically rectangular, although it may curve to conform to the predominant flight track.
- **APZ 2.** APZ 2 extends 7,000 feet beyond APZ 1, with a width of 3,000 feet. This zone is typically rectangular, although it too may conform to the curve of the predominant flight track.

Although ultimate control over land use and development in the vicinity of military facilities is the responsibility of local governments, the Navy recommends, through its AICUZ Program, that localities adopt programs, policies, and regulations to promote compatible development, where appropriate and feasible, near Naval and Marine Corps air installations. Such land-use recommendations by the Navy are intended to serve as guidelines; they are based on the assumption that noise-sensitive uses (e.g., houses, churches, hospitals, amphitheaters, etc.) should be located outside high-noise zones and people-intensive uses should not be located in APZs. The purpose of the Navy's land-use recommendations is not to preclude productive use of land around Naval and Marine Corps air installations but to recommend best uses of the land that are protective of human health, safety, and welfare. The Navy's recommendations can be

implemented by ensuring development restrictions are placed on noise-sensitive uses in high-noise zones and on people-intensive uses in APZs as well as fair disclosure in real estate transactions and the use of sound-attenuating construction.

The AICUZ Program for NAS Jacksonville was first established by the Navy in 1978 and was considered representative of operations at the station for more than 20 years. In 2006, the Navy completed an AICUZ update (approval pending) to incorporate the revised land-use compatibility guidelines contained within the updated OPNAVINST 11010.36B (Office of the Chief of Naval Operations December 19, 2002) and to address changes to recommended land uses in the vicinity of NAS Jacksonville.

The NAS Jacksonville APZs are from the 2001 AICUZ update and are shown on Figure 3-5. As shown, the majority of the clear zones for NAS Jacksonville are contained within the base boundaries. The boundaries of APZ 1 and APZ 2 extend off-station into the local community.

### **Regional Shore Infrastructure Plan (RSIP) Overview for the Jacksonville Fleet Concentration Area (FCA)**

The Jacksonville Fleet Concentration Area RSIP was completed in February 2003. The Jacksonville FCA includes NAS Jacksonville and three other Navy and Marine Corps installations in northern Florida and southern Georgia. The purpose of the RSIP is to support the long-range vision for the Navy's presence in the Jacksonville FCA and to ensure optimum use of resources through the next decade and beyond.

Current land uses at the installation generally fit the ideal land-use model, the only exceptions being the placement of some ordnance storage and warehouse facilities. However, adequate buffering and ESQD arc compliance make these locations acceptable. Airfield operations and family housing functions at NAS Jacksonville are shielded from each other with open space and personnel/community support areas. Separating two incompatible functions fits the ideal land-use relationship. Maintenance and training facilities are located adjacent to the airfield, which also fits the model.

The RSIP also includes an evaluation of development constraints at NAS Jacksonville to determine planning opportunities. Major development constraints at the installation include airfield clearances and noise zones located around the airfield in the northern portion of the installa-

tion and ESQD arcs that dominate the southern portion. Other portions of the installation with limited development potential include areas with poor soils, airfield transitional surfaces, built-up areas, and 65 to 75 dB DNL noise zones (Naval Facilities Engineering Command, Southern Division 2003).

### **Integrated Natural Resources Management Plan (INRMP)**

The Navy prepared an INRMP in 2005 for the Jacksonville Complex, including NAS Jacksonville, in compliance with DoD Instruction 4715.3 and the Sikes Act (16 U.S. Code [U.S.C.] 670a, et seq.). The INRMP outlines the goals of the natural resources program and describes how the installation's natural resources would be managed for the next 10 years while not interfering with the mission of the installation (Naval Facilities Engineering Command, Southern Division 2005).

The Jacksonville Complex Commanding Officer (JCCO) is responsible for managing all aspects of the installation's natural resources. The NAS Jacksonville Environmental Department is responsible for the programmatic oversight, management, and supervision of natural resources management for NAS Jacksonville.

### **City of Jacksonville Comprehensive Plan**

In accordance with State of Florida planning law (Chapter 163 [Part II], F.S. and Chapter 9J-5, F.A.C.), the city of Jacksonville adopted the 2010 Comprehensive Plan in 1990. The plan is primarily a policy document with generalized maps illustrating existing and future conditions. State law requires the city of Jacksonville to periodically complete an Evaluation and Appraisal Report (EAR) for the purpose of updating the comprehensive plan. The most recent EAR was adopted in 1997; an EAR update was adopted in November 2007 (City of Jacksonville July 2007).

The 2010 Comprehensive Plan recognizes the AICUZ concepts for NAS Jacksonville and accordingly recommends compatible development near the station in order to protect the safety and welfare of property owners, residents, and businesses in that area (City of Jacksonville May 2007). Proposed future land uses in the immediate vicinity of NAS Jacksonville are generally consistent with the existing mixture of residential, recreational, light industrial, and business/office uses.

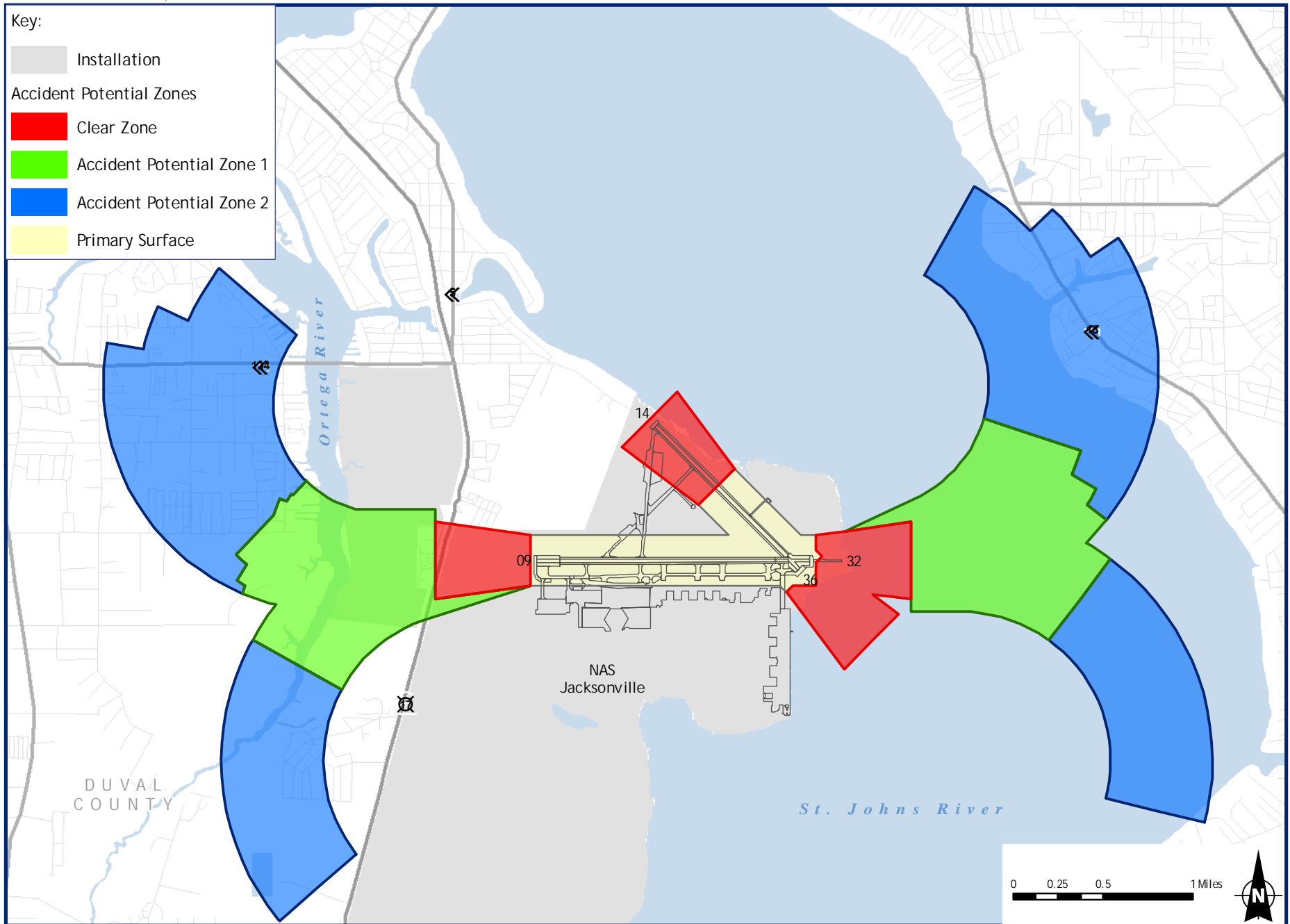


Figure 3-5  
AICUZ APZs at NAS Jacksonville,  
Jacksonville, Florida

### **City of Jacksonville Zoning Ordinance**

Zoning is the primary land-use control used by the city of Jacksonville to control development. As a federal facility, NAS Jacksonville is exempt from municipal zoning regulations.

Part 10 of the city of Jacksonville Zoning Code (Airport District Zoning Ordinance) regulates land uses adjacent to military and civilian airports. An amended Airport District Zoning Ordinance was adopted in March 2007 with the assistance of a technical advisory committee, which included a representative from NAS Jacksonville (City of Jacksonville March 27, 2005). The ordinance establishes noise zones and APZs that are intended to conform to the current noise zones and APZs developed by military installations within the city. Consequently, the land uses around NAS Jacksonville generally are consistent with the compatibility guidance for noise zones and APZs outlined in the currently approved NAS Jacksonville AICUZ update.

All residential and non-residential sales and leases and new residential development within the city's Noise Zones A and B and the Airport Noise Zone must include an executed statement, referred to as an Airport Noise Zone Acknowledgement, that such property "may be exposed to significant noise level and/or accident potentials or may be subject to special lighting regulations (for OLF Whitehouse) as a result of the airport operations."

### **Florida Coastal Management Plan (FCMP)**

NAS Jacksonville is located within Florida's coastal zone. The Coastal Zone Management Act (CZMA) of 1972 (16 U.S.C.1451 et seq., as amended) provides assistance to states, in cooperation with federal and local agencies, for developing land and water use programs in coastal zones. Section 307 of the CZMA stipulates that where a federal project initiates reasonably foreseeable effects on any coastal use or resource (land or water use or natural resource), the action must be consistent to the "maximum extent practicable with the enforceable policies of approved State management programs" (16 U.S.C. 1456 (c)(1)(A)).

Florida has developed and implemented a federally approved Coastal Management Program describing current coastal legislation and enforceable policies. The FCMP consists of 23 Florida statutes administered by 11 state agencies and four of the five state water quality management districts. It is designed to ensure the wise use and protection of the state's coastal resources, to ensure compliance with the state's growth management laws, to protect the state's



transportation system, and to protect the state's proprietary interest as the owner of sovereign submerged lands.

Federal lands, such as those comprising NAS Jacksonville, which are "lands the use of which is by law subject solely to the discretion of the Federal Government, its officers, or agent," are statutorily excluded from the CZMA's definition of the state of Florida's "coastal zone" (16 U.S.C. 1453(1)). If, however, the proposed federal activity affects coastal resources or uses beyond the boundaries of the federal property (i.e., has spillover effects), the CZMA Section 307 federal consistency requirement applies.

### **3.3.4 Land-Use Compatibility Assessment**

To determine the compatibility of land uses with existing aircraft operations at NAS Jacksonville, the 2011 baseline noise zone map was overlaid on the city of Jacksonville land-use map. As previously noted, the 2011 baseline noise zones are representative of conditions at NAS Jacksonville before the proposed introduction of the P-8A MMA. Land-use designations within the 2011 baseline noise zones were compared with the Navy/Marine Corps land-use compatibility recommendations under its AICUZ Program (see Appendix G).

Table 3-4 provides the total area, by land-use category, within the 65 dB to 70 dB DNL, the 70 dB to 75 dB DNL, and the greater-than-75 dB DNL noise zones around NAS Jacksonville. All land-use categories in the less-than-65 dB DNL noise zone are considered to be compatible, according to AICUZ guidelines.

As shown on Figure 3-6 and Table 3-4, approximately 1,910 acres (86%) of the land uses within the noise zones around NAS Jacksonville are considered compatible land uses, including military (58%), water (28%), and transportation/utilities (1%). The remaining 302 acres (14%) of land uses within the noise zones are generally compatible, provided that various noise-level reduction measures are incorporated into facility designs. As noted in Section 3.2, some residences are located within the greater-than-65 dB DNL noise zones at NAS Jacksonville. However, none of the land occupied by these residences within the baseline greater-than-65 dB DNL noise zone is designated as residential land use by the city of Jacksonville.

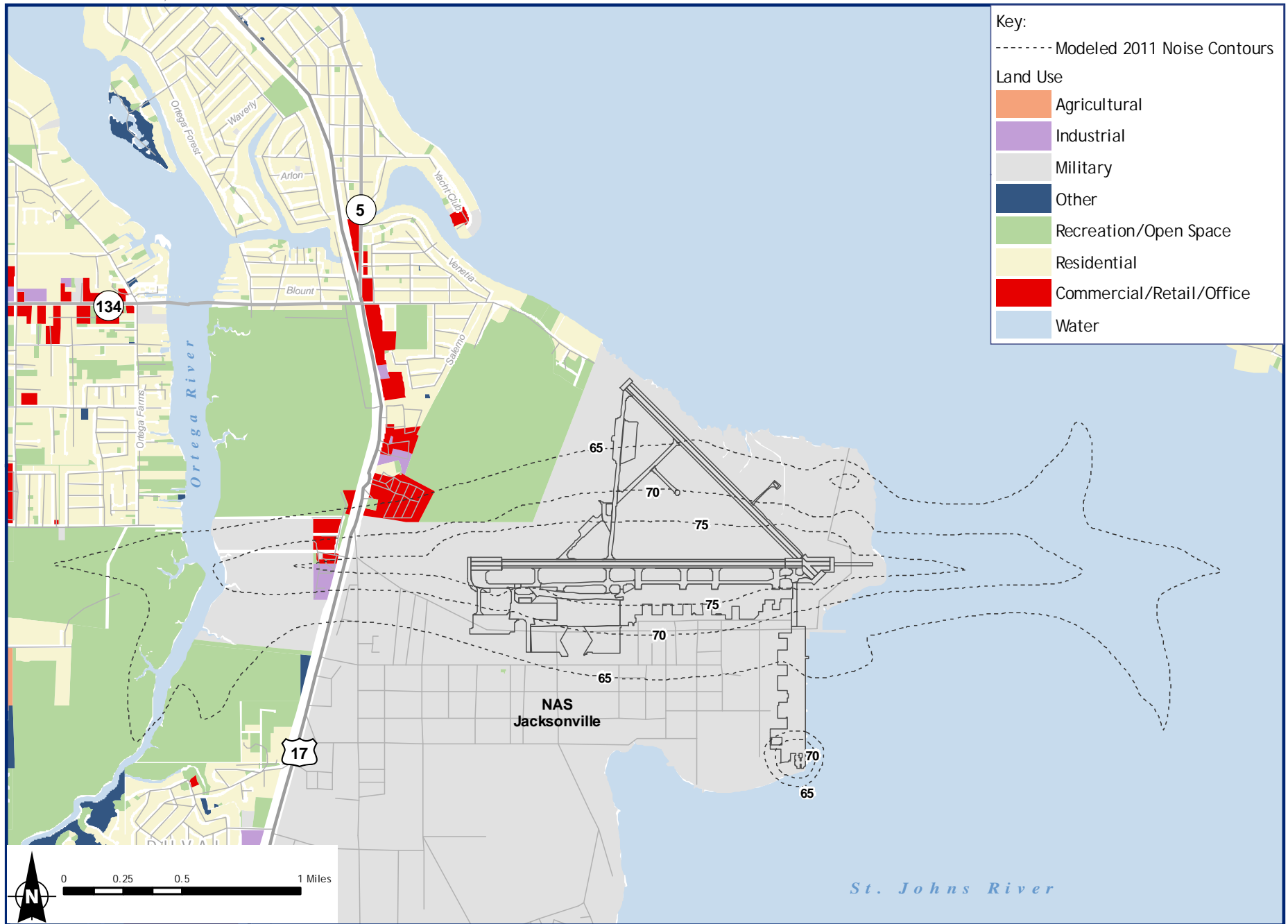


Figure 3-6  
 Existing Land Uses within Modeled 2011  
 DNL Noise Contours in the City of Jacksonville  
 Jacksonville, Florida

**Table 3-4 Existing Land Uses within Noise Zones at NAS Jacksonville**

Land Use	Noise Zone (acres)			Total Acres (% of Total Land Use)
	65 to 70 dB DNL	70 to 75 dB DNL	>75 dB DNL	
Residential	0	0	0	0 (0)
Commercial/Retail/Office	18	5	1	24 (1)
Industrial	1	5	2	8 (<1)
Recreation/Open Space	212	11	0	223 (11)
Transportation/Utilities	11	6	2	19 (<1)
Military	505	339	350	1,194 (58)
Water	458	108	11	578 (28)
<b>Total</b>	<b>1,205</b>	<b>476</b>	<b>366</b>	<b>2,046 (100)</b>

### 3.4 Air Quality

#### 3.4.1 Air Quality Regulations

The Clean Air Act (CAA) is the primary federal statute governing the control of air quality. The CAA designates six pollutants as “criteria pollutants” for which National Ambient Air Quality Standards (NAAQS) have been established to protect public health and welfare. These include particulate matter less than 10 microns in diameter (PM<sub>10</sub>), carbon monoxide (CO), sulfur dioxide (SO<sub>2</sub>), nitrogen dioxide (NO<sub>2</sub>), lead (Pb), and ozone (O<sub>3</sub>). Areas that do not meet NAAQS for criteria pollutants are designated “nonattainment areas” for that pollutant.

Areas achieving the air quality standard after being designated nonattainment are redesignated as attainment following EPA approval of a maintenance plan. Under the CAA, state and local agencies may establish ambient air quality standards (AAQS) and regulations of their own, provided these are at least as stringent as the federal requirements. Table 3-5 summarizes the federal and state AAQS.

The location of the proposed action is under the jurisdiction of the Jacksonville/Duval County local air quality program administered by the city of Jacksonville’s Regulatory and Environmental Services Department. Duval County is designated as in attainment for all criteria pollutant standards. As of June 15, 2005, the county is currently not considered a maintenance area for the 1-hour ozone standard. Because the region is currently in attainment, the CAA General Conformity Rule does not apply, and a General Conformity Determination is not required (U.S. Environmental Protection Agency 2007).

However, on March 12, 2008, the EPA revised the 8-hour ozone standard, from 0.08 parts per million (ppm) to 0.075 ppm. Compliance with the standards is based on the three-year average of the annual fourth-highest maximum daily 8-hour concentration. States must report to the EPA on which areas are to be designated with nonattainment status by March 2009, and final designations will be made as early as March 2010. Based on data collected in 2005-2007, Duval County would be designated a nonattainment area for the new ozone standard.

### **3.4.2 Existing Emissions**

Sources of air pollutants at NAS Jacksonville include mobile emissions from aircraft, ground service equipment and vehicles, private and government vehicles, and stationary source emissions from external combustion equipment, internal combustion engines, surface coating operations, solvent use, fuel storage tanks, and other miscellaneous operations. Stationary sources are operated under a site-wide Title V permit. The primary sources of hazardous air pollutants in the form of volatile organic compound (VOC) emissions are from solvent use, plating operations, paint spray booths, and gasoline dispensing.

**Table 3-5 National and Florida State Ambient Air Quality Standards**

Pollutant	Averaging Time	NAAQS <sup>1</sup>		Florida AAQS <sup>2</sup> Concentration <sup>5</sup>
		Primary <sup>3</sup>	Secondary <sup>4</sup>	
Ozone (O <sub>3</sub> ) <sup>6</sup>	1-Hour	–	–	0.12 parts per million (ppm) (235 micrograms per cubic meter [µg/m <sup>3</sup> ])
	8-Hour	0.08 ppm		Same as NAAQS
Carbon Monoxide (CO)	8-Hour	9.0 ppm (10 µg/m <sup>3</sup> )	None	Same as NAAQS
	1-Hour	35 ppm (40 µg/m <sup>3</sup> )		Same as NAAQS
Nitrogen Dioxide (NO <sub>2</sub> )	Annual Average	0.053 ppm (100 µg/m <sup>3</sup> )	Same as Primary Standard	Same as NAAQS
Sulfur Dioxide (SO <sub>2</sub> )	Annual Average	0.03 ppm (80 µg/m <sup>3</sup> )	–	0.02 ppm (60 µg/m <sup>3</sup> )
	24-Hour	0.14 ppm (365 µg/m <sup>3</sup> )	–	0.1 ppm (260 µg/m <sup>3</sup> )
	3-Hour	–	0.5 ppm (300 µg/m <sup>3</sup> )	Same as NAAQS

**Table 3-5 National and Florida State Ambient Air Quality Standards (continued)**

Pollutant	Averaging Time	NAAQS <sup>1</sup>		Florida AAQS <sup>2</sup> Concentration <sup>5</sup>
		Primary <sup>3</sup>	Secondary <sup>4</sup>	
Suspended Particulate Matter (PM <sub>10</sub> )	24-Hour	150 µg/m <sup>3</sup>	Same as	Same as NAAQS
	Annual Arithmetic Mean	50 µg/m <sup>3</sup>	Primary Standard	Same as NAAQS
Fine Particulate Matter (PM <sub>2.5</sub> ) <sup>6</sup>	24-Hour	65 µg/m <sup>3</sup>	Same as	—
	Annual Arithmetic Mean	15 µg/m <sup>3</sup>	Primary Standard	—
Lead (Pb)	30-Day Average	—	—	1.5 µg/m <sup>3</sup>
	Calendar Quarter	1.5 µg/m <sup>3</sup>	Same as Primary Standard	—

Source: Florida State Rules 62-204-240; U.S. Environmental Protection Agency 2007.

Notes:

<sup>1</sup> NAAQS (other than O<sub>3</sub>, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The O<sub>3</sub> standard is attained when the fourth highest 8-hour concentration in a year, averaged over three years, is equal to or less than the standard. For PM<sub>10</sub>, the 24-hour standard is attained when 99% of the daily concentrations, averaged over three years, are equal to or less than the standard. For PM<sub>2.5</sub>, the 24-hour standard is attained when 98% of the daily concentrations, averaged over three years, are equal to or less than the standard. Contact the EPA for further clarification and current federal policies.

<sup>2</sup> Florida State Ambient Air Quality Standards from Florida Regulations 62-204.240.

<sup>3</sup> National Primary Standards: The levels of air quality necessary, with an adequate margin of safety, to protect the public health.

<sup>4</sup> National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

<sup>5</sup> Concentration expressed first in units in which it was promulgated. In this table “ppm” refers to ppm by volume or micromoles of pollutant per mole of gas.

<sup>6</sup> New federal 8-hour ozone and fine particulate matter standards were promulgated by the EPA on July 18, 1997. On June 15, 2005 the EPA issued attainment designations for the 8-hour standard and established areas no longer under maintenance for the 1-hour ozone standard (U.S. Environmental Protection Agency 2007).

The activities that would be affected by this action are limited to the replacement of the six P-3C squadrons based at NAS Jacksonville. Emissions of criteria pollutants result from aircraft flight operations and maintenance (run-ups and test cell emissions) of the aircraft. Aircraft emissions were calculated using emission factors provided by the Navy’s Aircraft Environmental Support Office (AESO) and operations information from station personnel (Wyle Laboratories, Inc. October 2004). Emissions also result from the operation of personally owned vehicles (POVs) used by station personnel to commute to work. Emissions from the vehicles of P-3C personnel have been calculated. Annual emissions from the operations of P-3C aircraft and the POVs of personnel affected by this action are summarized in Table 3-6 (see Appendix H for emission calculation information).

**Table 3-6 Emissions Criteria Pollutants from P-3C Aircraft and POVs,  
NAS Jacksonville, Florida (Projected Baseline Year: 2011)**

Operation	Baseline Emissions (tpy)				
	CO	NO <sub>x</sub>	HC	SO <sub>2</sub>	PM <sub>10</sub>
P-3C Flight Operations	93.6	142.2	55.8	6.9	64.4
P-3C Maintenance	42.8	15.7	29.0	1.1	9.1
<b>P-3C Total</b>	<b>136.4</b>	<b>157.9</b>	<b>84.8</b>	<b>8.0</b>	<b>73.5</b>
POVs	84.5	8.5	8.9	0.1	1.1
<b>Total</b>	<b>220.9</b>	<b>166.4</b>	<b>93.7</b>	<b>8.2</b>	<b>75.6</b>

Key:

CO = Carbon monoxide.

HC = Hydrocarbons.

NO<sub>x</sub> = Nitrogen oxide.

PM<sub>10</sub> = Particulate matter less than 10 microns in diameter.

SO<sub>2</sub> = Sulfur dioxide.

tpy = Tons per year.

### **3.5 Socioeconomics**

Currently available data on population, housing, employment, taxes and revenue, and education were used to project the socioeconomic conditions in the baseline year, 2011. The discussion below indicates the assumptions made and describes how the final estimated numbers were reached. A full discussion of the methodologies used can be found in Appendix I.

#### **3.5.1 Population and Housing**

##### **3.5.1.1 Population**

###### **NAS Jacksonville**

NAS Jacksonville is located in the city of Jacksonville in northeastern Florida. It is host to more than 100 tenant and supported units. The number of personnel at NAS Jacksonville has fluctuated over the years as the result of BRAC closures and changes in aircraft loading. Table 3-7 presents historic and baseline personnel loading numbers for NAS Jacksonville by position/rank. Overall, the number of personnel stationed or employed by the base has decreased, and this condition is expected to continue to the baseline year of 2011. The decrease is mostly represented by a reduction in the number of civilians and contractors associated with NAS Jacksonville.

**Table 3-7 Personnel Loading Summary for NAS Jacksonville**

	1988	1997	2002	2011	% Change from 1988 to 2011
Officer	1,223	1,220	1,420	1,722	(+)41%
Enlisted	7,194	6,286	8,044	8,941	(+)24%
Civilians	10,883	6,531	6,722	6,442	(-)41%
Contractors	NA	2,642	2,589	416	(-)84% <sup>1</sup>
<b>Total</b>	<b>19,300</b>	<b>16,679</b>	<b>18,775</b>	<b>17,521</b>	<b>(-)9%</b>

Source: Naval Air Station Jacksonville 1997; Mytych, L. 2007.

Note:

<sup>1</sup> Percent change calculated from 1997 to 2011 because data was not available.

### **City of Jacksonville and Region**

The city of Jacksonville is divided into six planning districts, with NAS Jacksonville located in the Southwest Planning District. The Southwest Planning District is the third most populated district in the county. Table 3-8 presents the population changes and estimates for Duval County, the city of Jacksonville, and the Southwest Planning District for 1990, 2000, and 2011. The 2011 estimate has been used for the baseline population estimate for this analysis because it is the closest to the time that the proposed project would be initiated.

**Table 3-8 Population of Duval County, the City of Jacksonville, and the Southwest Planning District**

	1990	2000	2006	2011	% Change from 1990 to 2011
Duval County	672,971	778,879	891,192	953,932	(+)41.7%
City of Jacksonville	635,230	735,617	850,098	914,061	(+)43.9%
Southwest Planning District	122,527	133,867	N/A	177,728	(+)45.1%

Source: City of Jacksonville n.d. (2006 Statistical Package)

Note: The city of Jacksonville accounts for almost all of Duval County, both geographically and in population. The exception is the town of Baldwin and Jacksonville Atlantic and Neptune Beaches, which were not part of the consolidation.

#### **3.5.1.2 Housing**

##### **NAS Jacksonville**

The *2006 Housing Requirement Market Analysis Update* (Robert D. Niehaus, Inc. October 6, 2006) provides an estimate of military family housing and bachelor housing requirements projected for 2011. The study used a total baseline number of 9,508 families and bachelors (6,298 and 3,210, respectively) requiring housing. In the analysis for this EIS, an estimated 10,663 military personnel (the summation of officers and enlisted in 2011 [see Table 3-7]) re-

quiring housing in the baseline year 2011 was used. The housing analysis evaluates actual housing inventory, which is assumed to be the same in 2011 as in the 2006 report.

Military housing at the installation is expected to be close to 100% occupancy in 2011. According to the *2006 Housing Requirement Market Analysis Update*, NAS Jacksonville has 532 family housing units and 2,754 bachelor housing units. Assuming the same proportion of families to bachelors, there would be 7,063 families and 3,600 bachelors. Thus, either the need for more housing would be met by the surrounding community, or there would be a deficit of 998 family units and 672 bachelor units (Robert D. Niehaus, Inc. October 6, 2006).

There is a specific demand for two- and three-bedroom enlisted family housing. The waiting list in 2000 was approximately 12 to 18 months and 6 to 12 months, respectively. Demand for three- and four-bedroom officer units is also high, with a waiting period of 6 to 12 months and 12 to 24 months, respectively (U.S. Department of the Navy May 2002).

### **City of Jacksonville and Region**

The number of housing units in Duval County increased from 284,673 in 1990 to 329,778 in 2000 (a 16% increase). Similarly, in Clay County where a portion of the individuals employed by NAS Jacksonville reside, the number of housing units increased from 40,249 in 1990 to 53,748 in 2000 (a 34% increase). The ratio between owner-occupied and renter-occupied units in the county remained almost unchanged during this period, with owner-occupied units in Duval County comprising approximately 58% of all occupied units (see Table 3-9). Approximately 92% of the total housing units in Duval County are occupied, with 8% being vacant units, and 93.5% of the housing units in Clay County are occupied, with the balance being vacant units (U.S. Census Bureau 2000).

**Table 3-9 Regional Housing Availability (2000)**

	Housing Units				Vacancy Rate (%)
	Owner-Occupied	Renter-Occupied	Vacant	Total	
Duval County	191,722	112,025	26,031	329,778	7.9%
City of Jacksonville	179,782	104,710	24,244	308,736	7.9%
Clay County	39,120	11,123	3,505	53,748	6.5%

Source: U.S. Census Bureau 2007.

It was estimated that in 2006, 2,197 new residential units were permitted at a value of \$290,711,722. This was the second highest number of permits issued of all the city of Jackson-



ville planning districts (City of Jacksonville n.d. [2006 Statistical Package]), indicating a growth trend that parallels the expected rate of growth in the population.

### **3.5.2 Economy**

#### **3.5.2.1 NAS Jacksonville**

Economically, NAS Jacksonville is a significant component of the city of Jacksonville and region. It occupies a large section of real estate within city limits (almost 4,000 acres) and employs more than 17,500 individuals, including military and civilians (see Table 3-7). NAS Jacksonville is the largest industrial employer in northern Florida. It is estimated that in fiscal year (FY) 2007, NAS Jacksonville was responsible for a total annual payroll of \$962 million, including military, civilians, and contractors. In addition, the base spends money on goods and services in the local community on an annual basis for such items as utilities, telephone services, and contracts (NAS Jacksonville 2007).

Within the NAS Jacksonville region, it is estimated that 3.81% of those employed work in the military sector (see Table 3-10). There is also a large retired military component in the population.

**Table 3-10 Employment in the NAS Jacksonville Region (2005)**

	<b>Total Employment</b>	<b>Military Employment</b>	<b>Non-Military Employment</b>	<b>Percent Employed by Military</b>
Duval County	620,623	23,629	596,994	3.81%

Source: U.S. Department of Commerce 2007

Many military personnel, civilians, and contractors employed at NAS Jacksonville live in the community, spend money in the local economy, and use local amenities and resources. The payroll and expenditures of NAS Jacksonville thus have a compounding or multiplier impact.

To put it in perspective, the *Fiscal Year 2002 Regional Shareholders Report* issued by the Navy and Marine Corps Team of Northeast Florida and Camden County, Georgia, quantified the impact of NAS Jacksonville, Naval Station Mayport, Naval Submarine Base Kings Bay, and U.S. Marine Corps Blount Island Command on the region. The estimate included \$2.04 billion in military and civilian payroll, \$810 million in retiree payroll, and \$709 million in goods and services purchased in the local economy. The total impact of these four installations on the regional economy in FY 2002 was \$7.83 billion.

**3.5.2.2 City of Jacksonville and Region**

Over the past decade, per capita income and the labor force have been consistently growing. Table 3-11 shows historic unemployment rates for the city. As of 2006, Jacksonville's metropolitan statistical area (MSA) had a relatively low unemployment rate of 3.2%, which was comparable to that of the state of Florida (3.3%) and below the national average (4.6%).

**Table 3-11 Percentage of Unemployed in the City of Jacksonville MSA and the State of Florida (2000 – 2006)**

<b>Year</b>	<b>Florida</b>	<b>City of Jacksonville MSA</b>
2000	3.8	3.2
2001	4.7	4.1
2002	5.7	5.3
2003	5.3	5.0
2004	4.7	4.6
2005	3.8	3.8
2006	3.3	3.2

Source: U.S. Department of Labor 2007.

NAS Jacksonville is the top employer in the city of Jacksonville, with more than 17,500 employees. Table 3-12 lists the top ten private and public employers.

**Table 3-12 Top Private and Public Employers in the City of Jacksonville 2006**

<b>Government Employers</b>	<b>Sector</b>	<b>Employees</b>
Naval Air Station Jacksonville	U.S. Atlantic Fleet	17,521
Naval Station Mayport	U.S. Atlantic Fleet	16,246
Duval County Public Schools	Public Education	15,000
City of Jacksonville	Public Safety, Public Works, Social Services, Administration	9,398
Florida Community College at Jacksonville	College, Continuing Education, Career Training	3,209
U.S. Postal Services	Mail Processing and Delivery	2,917
University of North Florida	Education and Research	1,716
Internal Revenue Service	Federal Tax Law and Collection	1,337
Northeast Florida State Hospital	Comprehensive Mental Health Care	1,152
Blue Cross and Blue Shield of Florida	Mutual Insurance Company	8,082
Publix Super Markets	Grocery, Retail	7,106
Baptist Health	Health Care	6,928
Wal-Mart Stores	Discount Retailer	6,000
Mayo Clinic	Multi-Specialty Health Care	5,034

**Table 3-12 Top Private and Public Employers in the City of Jacksonville 2006  
(continued)**

Private Employers	Sector	Employees
Bank of America	Financial Services	4,500
CSX Transportation, Inc.	Railroad Transportation and Logistics	4,200
Citibank	Financial Services, Credit Cards, Technology	4,000
St. Vincent's Health System	Health Care	3,703

Source: City of Jacksonville n.d. (2006 Statistical Package).

### **3.5.3 Taxes and Revenues**

Jacksonville is a consolidated city/county political entity that extends geographically throughout Duval County, with the only exceptions being the town of Baldwin and the communities of Jacksonville Beach, Atlantic Beach, and Neptune Beach. Thus, budgets and taxation of properties within the area around NAS Jacksonville fall under the city's jurisdiction, although there may be other independent authorities (e.g., school board districts).

The gross annual budget for the city of Jacksonville for FY 2006-2007 was more than \$1.7 billion, an increase of more than \$100 million from the previous fiscal year. The city of Jacksonville raises a large proportion of the total budget revenues from local sources (including real estate taxes, charges for services, and personal property taxes), with the remainder of the revenue being supplied by the state or federal government (City of Jacksonville September 30, 2007).

Based upon the FY 2006-2007 budget and the estimated 2006 population for the city of Jacksonville, the local per capita tax burden is \$2,044.

### **3.5.4 Education**

There are more than 160 schools in the Duval County Public School District, serving a total student population of 124,945. During the 2005 to 2006 school year, the district employed 8,744 teachers for a total of 14,425 faculty and staff (Duval County Public Schools 2007). The district's schools include 105 elementary schools, 28 middle schools, and 19 high schools. Four alternative schools and three exceptional-student centers make up the balance of the public schools in the county. Numerous private schools are located throughout the county as well (Duval County Public Schools 2007). The school-aged population has been steadily increasing, which is to be expected with the overall growth in the regional population. Students in the NAS

Jacksonville area would most likely attend Venetia Elementary School, Jeb Stuart Middle School, and Robert E. Lee High School.

### **3.5.5 Environmental Justice**

Consistent with Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* (February 11, 1994), the Navy's policy is to identify and address any disproportionately high and adverse human health or environmental effects of its actions on minority and low-income populations. In addition, Executive Order 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, enacted in 1997, directed federal agencies to identify and assess environmental health and safety risks to children, coordinate research priorities on children's health, and ensure that their standards take into account special risks to children.

This analysis focuses on the potential for a disproportionate and adverse exposure of these specific off-base population groups to the projected aircraft noise under the alternatives at each base where the "greater than 65 DNL noise exposure" would be the greatest. The results of the analyses of these scenarios are similar, whether using the alternative with the most squadrons allocated to that base or the least number, the only exception being alternatives where no P-8A MMA squadrons are proposed.

In this analysis, minority and low-income populations and children were defined as follows:

- **Minority.** Individuals who are Black/African-American, Asian, Pacific Islander, American Indian, Eskimo, Aleut, or other non-white persons (a separate distinction has been made for people of Hispanic origin).
- **Low-Income.** Individuals living below the poverty line as defined by the U.S. Census Bureau.
- **Children.** Individuals under the age of 18.

Statistics pertinent to the study area surrounding NAS Jacksonville are summarized in Table 3-13 below. (Section 4.5.5 presents data on the individual census tracts that would be most affected by aircraft noise [i.e., all census tracts that are crossed or encompassed by the 65 dB DNL noise contour]).

**Table 3-13 Environmental Justice Statistics for NAS Jacksonville Analysis (2000)**

	<b>Total Population</b>	<b>Percent Minority</b>	<b>Percent Hispanic</b>	<b>Percent Low-Income</b>	<b>Percent Children</b>
State of Florida	15,982,378	22.0	16.8	12.5	22.7
Duval County	778,879	34.2	4.1	11.9	26.3
City of Jacksonville	735,617	35.5	4.1	12.2	26.7

Source: U.S. Census Bureau 2002.

The comparison geographic areas for this environmental justice analysis are the city of Jacksonville, Duval County, and the state of Florida. Data from 2000 have been used in this analysis because the census tract-level data (used in Section 4.5.5) are not available for any year after 2000.

### **3.6 Infrastructure and Utilities**

As noted above in the Introduction to this section, these resources would not be affected by the proposed action and so are not discussed in this EIS.

### **3.7 Community Services**

As noted above in the Introduction to this section, these resources would not be affected by the proposed action and so are not discussed in this EIS.

### **3.8 Transportation**

As noted above in the Introduction to this section, transportation would not be affected by the proposed action and so is not discussed in this EIS.

### **3.9 Topography and Soils**

Topography at NAS Jacksonville is characterized by level to gently sloping land. Much of the airfield and adjacent developed area has been graded and is nearly level at 15 feet amsl. Elevations throughout the remainder of the station generally range from 15 to 25 feet amsl, with only minor topographic variation. The proposed construction area is at approximately 15 feet amsl and has a gradual north-to-south slope.

Nineteen soil types are mapped within the boundaries of NAS Jacksonville. The dominant soils mapped within the proposed construction area are Salepo fine sand and Mascotte-Pelham complex soils. Each of these soils are identified as very deep and poorly drained, with moderate permeability. However, because the construction area has been previously disturbed, it

is likely that most of the original soils have either been removed or are covered with fill materials.

### **3.10 Water Resources and Wetlands**

#### **3.10.1 Surface Water**

NAS Jacksonville is located within the lower St. Johns River basin. This watershed covers approximately 2,750 square miles in northeastern Florida; it extends from the confluence of the St. Johns and Ocklawaha rivers north to the mouth of the St. Johns River near Mayport, Florida (St. Johns River Water Management District September 2005).

The station is bordered on the east by the lower St. Johns River and on the west by the Ortega River, a tributary to the St. Johns River. The St. Johns River in the vicinity of the station is a tidal estuary with a slow-moving northward current. The river empties into the Atlantic Ocean approximately 24 miles northeast of the station. In periods of low tides, saltwater has been found as far as 140 miles downstream of NAS Jacksonville (St. Johns River Water Management District September 2005). The Ortega River is also a northward-flowing water body and enters the St. Johns River approximately 3 miles north of the station.

Primary surface water bodies at NAS Jacksonville include an unnamed tributary to the St. Johns River, three unnamed tributaries to the Ortega River, and two dredged lakes (Casa Linda Lake and Lake Scotlis) (see Figure 3-7). The St. Johns River tributary is a narrow stream flowing south-southeastward through an undeveloped area in the southern portion of the station. Each of the tributaries to the Ortega River flow west beneath U.S. Highway 17 before discharging to the river. Casa Linda Lake and Lake Scotlis cover 10 acres and 3 acres, respectively, and are located in the center of the station. No surface water bodies occur within or immediately adjacent to any of the proposed construction areas.

The state of Florida classifies surface waters according to their beneficial uses. These classifications are Class I (potable water supplies); Class II (shellfish propagation or harvesting); Class III (recreation and fish and wildlife propagation); Class IV (agricultural water supplies); and Class V (navigation, utility, and industrial use). The St. Johns River, its tributaries, and lakes within the lower St. Johns River basin are designated as Class III (Florida Department of Environmental Protection 2006).

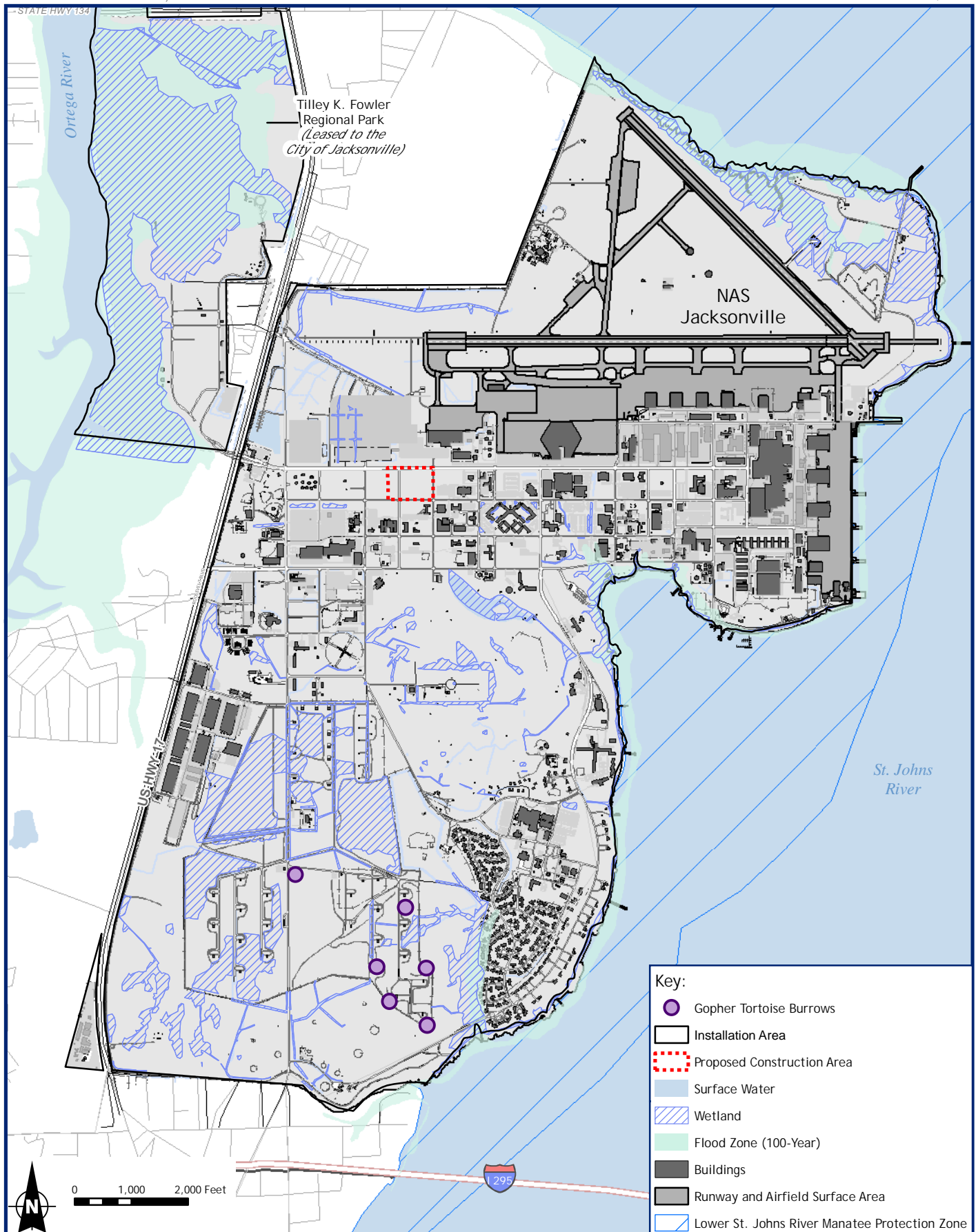


Figure 3-7  
 Natural Resources  
 NAS Jacksonville, Jacksonville, Florida

### **3.10.2 Water Quality**

Impervious surfaces cover approximately 35% of the land area at NAS Jacksonville. Surface runoff from NAS Jacksonville flows eastward to the St. Johns River or westward to the Ortega River. An extensive storm sewer network consisting of concrete piping, brick-lined open channels, and box culverts conveys surface runoff from these basins to the St. Johns and Ortega rivers.

NAS Jacksonville complies with its National Pollutant Discharge Elimination System (NPDES) permit for release of storm water from various industrial facilities located at the station. As part of the permit program, NAS Jacksonville has prepared a Storm Water Management Plan (SWMP) and a Storm Water Pollution Prevention Plan (SWPPP) to control storm water discharges from the station that may adversely affect water quality in the lower St. Johns River basin. The plans include a description of the existing drainage conditions for each drainage basin on the station and basin-specific recommendations for storm water-management facilities. Storm water controls implemented at the station are based primarily on the St. Johns River Water Management District regulations for storm water management. The following structural best management practices (BMPs) have been installed throughout the developed areas of the station to improve the quality of storm water runoff:

- Stabilized drainage channels designed to dissipate water during storm events;
- Wet and dry detention/retention ponds; and
- Grass swales and ex-filtration devices.

Numerous structural BMPs are also employed throughout on-station non-industrial and industrial process areas such as vehicle or aircraft maintenance, wash-down, and fueling areas; outdoor material storage, loading, and unloading areas; and waste disposal areas that are exposed to storm water. Structural BMPs include skimmer dams, spill-control gates, oil/water separators, and roof and canopy structures over solid/hazardous waste storage areas.

The proposed construction area at NAS Jacksonville is located within the northern portion of Drainage Basin 17. This basin covers approximately 350 acres and includes a mixture of vegetated and impervious surfaces. The northern portion of the basin drains in a southward direction within closed storm sewer systems that discharge into Casa Linda Lake, a permitted detention pond (Naval Facilities Engineering Command Southwest September 2006).



### **3.10.3 Floodplains**

Executive Order 11988, *Floodplain Management*, requires that federal agencies identify and consider practicable alternatives for locating incompatible facilities in areas identified as floodplains. Where practicable alternatives are not available, federal structures and facilities must be constructed in accordance with and be consistent with the intent of the standards and criteria of the National Flood Insurance Program (NFIP).

Most of NAS Jacksonville is located outside the 100-year floodplain (see Figure 3-7). Narrow floodplains associated with the St. Johns River occur along the northern and eastern boundaries of the station, while the majority of the station property west of U.S. Highway 17 is within the Ortega River floodplain. No 100-year floodplains are mapped within or adjacent to any of the proposed construction areas at NAS Jacksonville.

### **3.10.4 Groundwater**

Water beneath NAS Jacksonville is present in three main groundwater systems: a surficial aquifer; the Hawthorne aquifer; and the Floridian aquifer. The surficial aquifer is present on the station from land surface to approximately 15 to 35 feet below ground surface (bgs). Groundwater in this aquifer flows from high to low topography and toward surface water bodies. Many ditches and the unnamed streams on the station drain groundwater from the surficial aquifer to the St. Johns and Ortega rivers. Groundwater in this aquifer is not a water supply for NAS Jacksonville or surrounding areas (Agency for Toxic Substances and Disease Registry July 7, 2005).

The Hawthorne aquifer ranges from about 35 to 400 feet bgs. The aquifer is approximately 10 to 75 feet below sea level and ranges from 250 to 500 feet in thickness throughout Duval County. While some private wells near NAS Jacksonville are located within the Hawthorne aquifer, NAS Jacksonville does not use this aquifer as a water supply (Agency for Toxic Substances and Disease Registry July 7, 2005).

The Floridian aquifer begins about 400 feet bgs at NAS Jacksonville and extends more than 1,000 feet bgs. Groundwater in the aquifer flows east-northeast. The Floridian aquifer is the principal source of potable water in northeast Florida. NAS Jacksonville draws water from two active wells within this aquifer (Agency for Toxic Substances and Disease Registry July 7, 2005).

Groundwater within the surficial aquifer and top layer of the Hawthorne aquifer beneath NAS Jacksonville has been contaminated with solvents, pesticides, herbicides, semi-volatile organic compounds (SVOCs), metals, radionuclides, and cyanide from various on-station activities. No contaminants have been detected in groundwater at more than 60 feet bgs. Because of the artesian nature of the Floridian aquifer, groundwater movement is likely upward toward the surficial aquifer, rather than downward from the surficial aquifer. Consequently, no groundwater used by NAS Jacksonville residents and personnel drawn from the Floridian aquifer has been or would be exposed to contaminants. NAS Jacksonville also regularly monitors areas with groundwater contamination to ensure that contaminated groundwater is not migrating off-site (Agency for Toxic Substances and Disease Registry July 7, 2005).

### **3.10.5 Wetlands**

Executive Order 11990, *Protection of Wetlands*, requires that federal agencies adopt a policy to avoid, to the extent possible, long- and short-term adverse impacts associated with destruction and modification of wetlands and to avoid the direct and indirect support of new construction in wetlands whenever there is a practicable alternative.

Field delineations of jurisdictional wetland boundaries at NAS Jacksonville were completed in 1997 and 2003 (CZR Incorporated Environmental Consultants June 1997; Dial Cordy and Associates, Inc. April 9, 2003). These surveys show approximately 627 acres of jurisdictional wetlands within the boundaries of the station (see Figure 3-7). The wetland communities on NAS Jacksonville are predominantly freshwater marshes and floodplain swamps associated with the St. Johns River, interspersed with some small forested wetlands (Naval Facilities Engineering Command, Southern Division 2002). No wetlands were mapped within or directly adjacent to the proposed construction area at the station at the time of the 2003 survey. A field reconnaissance of the construction area completed in January 2007 confirmed the absence of wetlands in the area.

## **3.11 Biological Resources**

### **3.11.1 Vegetation**

Natural vegetative communities cover approximately 1,120 acres (29%) of the NAS Jacksonville property. These communities are primarily confined to the southern end of the station

around the ordnance storage area and to the northwest section of the station west of U.S. Highway 17. The remainder of the installation has been developed and vegetation in these areas is limited to managed communities, including lawns, a golf course, ornamental trees and shrubs, and fragmented forest stands.

The two primary natural vegetative communities at NAS Jacksonville are mesic flatwoods and floodplain swamp. Other natural communities include dome swamp, estuarine tidal marsh, floodplain marsh, scrubby flatwoods, and upland mixed forest (Naval Facilities Engineering Command, Southern Division 2002). Vegetation in the proposed construction area at NAS Jacksonville is primarily maintained lawn. A portion of the construction area also includes a fragmented stand of upland mixed forest, which is bounded on all sides by maintained lawn or roads.

### **3.11.2 Wildlife**

Wildlife diversity and abundance is limited at NAS Jacksonville by the on-station development and intense suburban development surrounding the station. The forested upland and wetland communities on the station are most commonly used by gray squirrel, raccoon, opossum, and various species of reptiles, amphibians, songbirds, woodpeckers, and raptors. Larger mammals such as red and gray fox are also known to occur in these habitats, but much less frequently. Various migratory waterfowl species rest in the aquatic habitats on and near the station and occasionally forage on the maintained herbaceous vegetation within the station.

The waters of the St. Johns River provide habitat for marine, estuarine, and anadromous fish and invertebrates. Shrimp, blue crab, striped mullet, croaker, sea trout, American shad, redfish, and striped bass are caught commercially and recreationally in the river (National Oceanic and Atmospheric Administration 2007b).

#### **3.11.2.1 Migratory Birds**

The Migratory Bird Treaty Act (MBTA) is the primary legislation in the United States established to conserve migratory birds. The MBTA prohibits taking, killing, or possessing migratory birds unless permitted by regulation. Under 50 CFR Part 21, the Armed Forces are authorized to take migratory birds during military readiness activities; however, the Armed Forces must confer and cooperate with the U.S. Fish and Wildlife Service (USFWS) on the development and implementation of conservation measures to minimize or mitigate adverse effects of military

readiness activities if it determines that such activity may have a significant adverse effect on a population of migratory birds. Congress defined military readiness as all training and operations of the Armed Forces related to combat and the adequate and realistic testing of military equipment, vehicles, weapons, and sensors for proper operation and suitability for combat use. An activity has a significant adverse effect if, over a reasonable period of time, it diminishes the capacity of a population of a migratory bird species to maintain genetic diversity, to reproduce, and to function effectively in its native ecosystem.

Military readiness activities do not include routine operation and maintenance of the aircraft at the airfield or construction of support infrastructure. These operations are considered non-military readiness activities. Migratory bird conservation relative to non-military readiness activities is addressed separately in a Memorandum of Understanding (MOU) developed in accordance with Executive Order 13186, signed January 10, 2001, “*Responsibilities of Federal Agencies to Protect Migratory Birds*.” The MOU, between the DoD and the USFWS, outlines the responsibility of federal agencies to protect migratory birds and how to incorporate conservation efforts into their routine operations and construction activities.

A study of migratory birds at NAS Jacksonville was conducted between 1997 and 2001 (Naval Facilities Engineering Command, Southern Division 2001). The study identified more than 50 species of neotropical migratory bird species on the station. The most common species on the installation covered by the MBTA included the Eastern towhee (*Pipilo erythrophthalmus*), Carolina wren (*Thryothorus ludovicianus*), Northern cardinal (*Cardinalis cardinalis*), and Great-crested flycatcher (*Myiarchus crinitus*).

### **3.11.2.2 Bird-Aircraft Strike Hazards**

The presence of resident and migratory birds creates a bird-aircraft strike hazard (BASH) risk at NAS Jacksonville. The airfield’s proximity to a major river, several large hangars, and expanses of grass and emergent wetlands adjacent to the airfield enhances the BASH risk. NAS Jacksonville has prepared a BASH plan to reduce the potential for collisions between aircraft and birds or other animals. The BASH plan prescribes an ongoing process that involves the distribution of information and active and passive measures to control how birds use the critical areas around the airfield. Methods outlined in the plan to reduce BASH risk at the airfield include habitat management, bird dispersal, depredation, and bird avoidance.

### 3.11.3 Threatened and Endangered Species

The Endangered Species Act (ESA) of 1973 and subsequent amendments provide for the conservation of threatened and endangered species of animals and plants and the habitats in which they are found. The Navy ensures that consultations are conducted as required under Section 7 of the ESA for any action that “may affect” a federally listed threatened or endangered species. The protection of non-federally listed species listed at the state level as threatened or endangered is not legally mandated for federal agencies. However, the Navy encourages cooperation with states to protect such species.

In 1997, the Florida Natural Areas Inventory (FNAI) conducted a survey for endangered, threatened, and rare plant and animal species occurring on NAS Jacksonville and other Navy properties in the region (Florida Natural Areas Inventory 1997). Additionally, the FNAI submitted a final report in June 2004 on field surveys conducted on selected rare species found at NAS Jacksonville and supporting installations. The North Florida Field Office of the USFWS and the Florida Fish and Wildlife Conservation Commission (FFWCC) were contacted to obtain updated information on protected species on and in the vicinity of NAS Jacksonville. Both agencies maintain databases to track the occurrence of threatened and endangered species; the USFWS provides species occurrences on a county level (Shipp May 23, 2007), and the FFWCC provides site-specific reports of species occurrences (Stearns June 6, 2007).

Based on the FNAI 1997 and 2004 studies and recent agency consultation, federally listed threatened and endangered species occurring within or in the immediate vicinity of NAS Jacksonville and adjacent waters include the West Indian manatee (*Trichechus manatus latirostris*), wood stork (*Mycteria Americana*), eastern indigo snake (*Drymarchon corais couperi*), and shortnose sturgeon (*Acipenser brevirostrum*) (U.S. Fish and Wildlife Service, North Florida Office 2007a; Florida Natural Areas Inventory 1997; Florida Natural Areas Inventory June 2004; Stearns June 6, 2007). The current federal protection status of each of these species is indicated in Table 3-14.

**Table 3-14 Federally Protected Species and Species of Concern at or in the Vicinity of NAS Jacksonville**

Category	Species	Species	Status	
	Common Name	Scientific Name	Federal	State
Federal Threatened and Endangered Species				
Mammals	West Indian manatee	<i>Trichechus manatus latirostris</i>	E; MMPA	E
Birds	Wood stork	<i>Mycteria Americana</i>	E	E

**Table 3-14 Federally Protected Species and Species of Concern at or in the Vicinity of NAS Jacksonville (continued)**

Category	Species Common Name	Species Scientific Name	Status	
			Federal	State
Reptiles	Eastern indigo snake	<i>Drymarchon corais couperi</i>	T	T
Fish	Shortnose sturgeon	<i>Acipenser brevirostrum</i>	E	E
<b>Other Species of Concern<sup>1</sup></b>				
Mammals	Sherman's fox squirrel	<i>Sciurus niger shermani</i>	N	SSC
Birds	Least tern	<i>Sterna antillarum</i>	N	T
	Snowy egret	<i>Egretta thula</i>	N	SSC
	Little blue heron	<i>Egretta caerulea</i>	N	SSC
	Tricolored heron	<i>Egretta tricolor</i>	N	SSC
	Bald eagle	<i>Haliaeetus leucocephalus</i>	N	T
Reptiles	Gopher tortoise	<i>Gopherus polyphemus</i>	N	SSC
Plants	Southern red lily	<i>Lillium catesbaei</i>	N	T

Source: U.S. Fish and Wildlife Service 2007a; Florida Natural Areas Inventory 1997, June 2004; Stearns June 6, 2007; Mincey May 31, 2007.

Note:

<sup>1</sup> These species are not protected under federal law.

Key:

E = Endangered.

MMPA = Marine Mammal Protection Act.

N = Not listed.

SSC = Species of Special Concern.

T = Threatened.

### 3.11.3.1 Manatee

Florida manatees, a native subspecies of the West Indian manatee, inhabit freshwater, brackish, and marine habitats in coastal and inland areas of the southeastern U.S. Shallow grass beds located near deep channels are preferred manatee feeding areas in these habitats (U.S. Fish and Wildlife Service 2001). The FNAI recorded 82 manatees along the immediate coastline of NAS Jacksonville during the 1996 survey (Florida Natural Areas Inventory 1997). During the summer manatees regularly feed along the station shoreline in Mulberry Cove.

The stretch of the St. Johns River adjacent to NAS Jacksonville is part of the Lower St. Johns River Manatee Refuge (see Figure 3-7). The refuge was established to prevent the taking of manatees from collisions with watercraft. In the portion of the refuge adjacent to the station, watercraft are required to travel at slow speeds within the manatee protection zone and no more than 25 miles per hour (mph) while in the channel (U.S. Fish and Wildlife Service North Florida Field Office 2007b).

### **3.11.3.2 Wood Stork**

Wood storks use a variety of freshwater and estuarine wetlands for nesting and feeding. Preferred nest sites are medium to tall trees either in water or on islands surrounded by large open water areas. Storks will normally use the same nest sites every year, provided the sites remain undisturbed and sufficient forage habitat remains available in adjacent wetlands. Typical forage areas include freshwater marshes, narrow tidal creeks, shallow tidal pools, agricultural or roadside drainage ditches, and managed impoundments. Most foraging occurs within 13 miles from nesting colonies, although wood storks have been observed to travel up to 60 miles from nest sites to forage (U.S. Fish and Wildlife Service 1997). There are approximately 50 documented wood stork nesting colonies in north Florida. In 2004, the FNAI surveyed potential wood stork nesting habitat on NAS Jacksonville. Transect surveys were completed through forested wetlands along the Ortega River to determine the presence or absence of wood stork nesting. No sign of wood storks or other colonial nesting birds was observed. The swamp along the Ortega River was determined to be not typical of wood stork nesting habitat and the area is not likely to attract wood storks in search of new nesting areas (Florida Natural Areas Inventory June 2004).

The closest wood stork nesting colony to NAS Jacksonville is located approximately 10 miles north of the station within the St. Johns River floodplain (U.S. Fish and Wildlife Service 2007). Wood storks are commonly observed feeding along the shores of Lake Scotalis on the station (U.S. Navy and National Fish and Wildlife Foundation n.d.)

### **3.11.3.3 Eastern Indigo Snake**

The eastern indigo snake most commonly inhabits sites with dry, well-drained sandy soils. The indigo snake is closely associated with the gopher tortoise when in this habitat and uses gopher tortoise burrows as dens and for egg-laying (U.S. Fish and Wildlife Service January 1991). Gopher tortoise burrows are present in the southern portion of the station within the weapons compound. However, indigo snakes are not known to occupy the burrows.

#### **3.11.3.4 Shortnose Sturgeon**

The shortnose sturgeon is a semi-anadromous species, inhabiting the lower estuarine portions of rivers and traveling upstream to spawn. Breeding normally occurs over rocky or gravelly substrate or limestone outcroppings.

An intensive sampling effort was completed in 2002 and 2003 by researchers working cooperatively with the USFWS to determine population levels of shortnose sturgeon in the lower St. Johns River (Florida Fish and Wildlife Conservation Commission n.d.) Only one shortnose sturgeon was collected during 820 hours of sampling. The sturgeon was captured near the most common area of historical shortnose sturgeon catches, which is located approximately 40 miles upstream of NAS Jacksonville.

#### **3.11.3.5 Other Species of Concern**

Other species of concern on or in the immediate vicinity of NAS Jacksonville include the bald eagle, Sherman's fox squirrel, least tern, snowy egret, little blue heron, tricolored heron, gopher tortoise, and southern red lily. The current protection status of these species is indicated in Table 3-14.

The USFWS removed the bald eagle from the endangered species list under the ESA effective August 8, 2007. However, on a federal level, taking of bald eagles is still prohibited under the Bald and Golden Eagle Protection Act (BGEPA) and the MBTA. Bald eagles nest in the tops of large trees near rivers, lakes, marshes, or other wetland areas. Florida supports the largest number of breeding bald eagles of any southeastern state. The FFWCC completed an aerial survey of known eagle nesting territories during 2005 and 2006 (Florida Fish and Wildlife Conservation Commission January 11, 2007). This survey identified four bald eagle nests within approximately 3 miles of NAS Jacksonville:

- An inactive bald eagle nest site is located in the southeastern portion of the station adjacent to the St. Johns River shoreline. The last known activity within the nest occurred in 1992.
- A bald eagle nest that was confirmed active in 2003 is located approximately 0.5 miles west of the station within the Ortega River floodplain. The current status of this nest is unknown.
- An active bald eagle nest is located on the eastern shore of the St. Johns River, approximately 2.5 miles east of the station.
- An active bald eagle nest is located near NAS Jacksonville's golf course.



Fox squirrels inhabit mature longleaf pine-savanna with turkey oak. This species has been observed in the southern end of the station within or near the pine flatwoods in the Weapons Area (Florida Natural Areas Inventory 1997; 2007).

Least terns in Florida nest primarily along the coast, where beaches and roofs provide nest sites and nearby waters supply small forage fish (Florida Fish and Wildlife Conservation Commission n.d.). This species has been observed previously near the station over the St. Johns and Ortega Rivers; no rooftop nesting was observed on the station (Florida Natural Areas Inventory 1997; Stearns June 6, 2007).

Wading birds, including the snowy egret, little blue heron, and tricolored heron, have been observed foraging on mud flats along the St. Johns River adjacent to Mulberry Cove and on the dredged lakes on the station (Florida Natural Areas Inventory 1997; Stearns June 6, 2007).

Gopher tortoises inhabit pine and oak uplands, pine flatwoods, and ruderal areas (e.g., roadsides, fence rows, old fields, etc.). Suitable gopher tortoise habitat exists primarily in the southern portion of the station in the vicinity of the weapons bunkers and weapons compound. Six active and two abandoned gopher tortoise burrows were found in the southeast corner of the weapons compound during field surveys completed in 2005 (see Figure 3-7) (NAS Jacksonville July 14, 2006). The Navy prepared a Gopher Tortoise Management Plan for the station to address maintenance issues in the weapons area and because the tortoise is a keystone species whose removal from the station would impact other species, possibly including federally listed species (NAS Jacksonville July 14, 2006). The plan provides actions for habitat improvements, habitat protection, and tortoise relocations when necessary for safety or mission-related development (NAS Jacksonville July 14, 2006).

The southern red lily is found in wet to occasionally dry flatwoods. This species has been documented growing in small groupings along mowed roadways and roadway drainage ditches in the southern end of the station (Florida Natural Areas Inventory 1997).

#### **3.11.4 Marine Mammals**

The MMPA is administered by the USFWS and the National Oceanic and Atmospheric Administration (NOAA) Fisheries to protect and manage marine mammals. NOAA Fisheries provided a list of federally protected species, under the jurisdiction of the National Marine Fisheries Service (NMFS), known to occur in Florida state waters (Mincey May 31, 2007). With the

exception of the manatee, no marine mammals occur in the St. Johns River near NAS Jacksonville. The protection of coastal marine mammal species such as the manatee is under the jurisdiction of the USFWS. The manatee, as noted above, is known to occur in the St. Johns River adjacent to NAS Jacksonville.

### **3.12 Cultural Resources**

The 1966 National Historic Preservation Act (NHPA), Public Law 89-665, as amended by Public Law 96-515, 16 U.S.C. 470 et seq., establishes the National Register of Historic Places (NRHP), which includes historic properties such as districts, sites, buildings, structures, and objects that are significant in American history, architecture, archaeology, and culture. Section 106 of the NHPA requires that federal agencies with jurisdiction over a proposed federal project take into account the effect of actions on cultural resources listed, or eligible for listing, on the NRHP, and affords State Historic Preservation Offices (SHPOs) and the Advisory Council on Historic Preservation (ACHP) an opportunity to comment with regard to an undertaking. The NRHP eligibility criteria are defined by the Secretary of the Interior's Standards for Evaluation (36 CFR 60).

A National Register resource is a building, structure, site, district, or object that is included in or eligible for inclusion in the NRHP. Properties that qualify for the NRHP must generally be at least 50 years old; possess integrity of location, design, setting, materials, workmanship, feeling, and association; and meet one or more of the following criteria:

- **Criterion A.** Properties associated with events that have made a significant contribution to the broad patterns of our history;
- **Criterion B.** Properties associated with the lives of persons significant in our past;
- **Criterion C.** Properties that embody the distinctive characteristics of a type, period, or method of construction; or
- **Criterion D.** Properties that have yielded, or may be likely to yield, information important in prehistory or history (36 CFR 60.4).

The Navy has conducted inventories of cultural resources at NAS Jacksonville to identify properties that are listed or potentially eligible for listing in the NRHP. The results of these studies and proposed mitigation measures have been summarized in the station's Integrated Cultural Resources Management Plan (ICRMP).

### **3.12.1 Architectural Resources**

NAS Jacksonville has seven buildings built before 1960 that have been determined to be potentially eligible for listing on the NRHP. Four of the buildings are located adjacent to the airfield and are associated with aircraft maintenance operations; the other three buildings are part of the Chapel Complex in the southern portion of the station and include two churches and a church office. At present, none of these potentially eligible properties are listed in the NRHP.

### **3.12.2 Archaeological Resources**

Thirty-six archaeological sites have been recorded at NAS Jacksonville, none of which have been determined to be eligible for listing on the NRHP. An earlier Phase 1 archaeological survey of the proposed construction area indicated that no cultural resources were recorded within the site (U.S. Department of the Navy 2002).

## **3.13 Environmental Management**

### **3.13.1 Hazardous Materials and Waste Management**

A variety of hazardous materials are used at NAS Jacksonville, including petroleum, oils, and lubricants (POLs); solvents and thinners; caustic cleaning compounds and surfactants; cooling fluids (antifreeze); adhesives; acids and corrosives; paints; and herbicides, pesticides, and fungicides. Hazardous materials are used for aircraft and vehicle repair and maintenance activities at NAS Jacksonville. Activities at NAS Jacksonville that generate hazardous waste include painting, using solvents for cleaning and degreasing, mechanical and chemical paint and rust removal, fluids change-out, electroplating, metal casting, machining, and welding or soldering. If not consumed during use, these materials and possibly their containers eventually may be disposed of as a solid or hazardous waste.

The DoD collects annual hazardous- and solid-waste generation data for each Navy, Marine Corps, and Air Force installation in order to track its progress in meeting its goals for waste reduction. Waste categories in the Pollution Prevention Annual Data Summary are defined by the source of waste, such as the plating shop (electroplating and circuit-board manufacturing processes), fluids change (i.e., used solvents, hydraulic fluids, lubricants), facility operations (i.e., cleaning and maintenance, pest-management applications, used batteries), chemical paint stripping, painting operations, and rust and coating removal.

NAS Jacksonville is a large-quantity generator of hazardous waste, as defined by the Resource Conservation and Recovery Act (RCRA), a status applying to facilities generating 2,200 pounds (1,000 kilograms [kg]) or more of hazardous waste every month. In 2006, NAS Jacksonville generated 2.8 million pounds of hazardous waste, which was managed in compliance with their RCRA Part B operating permit issued by the state of Florida.

Further review of waste generation data by squadron shows that approximate waste generation per P-3C squadron averaged 1,200 pounds in 2006, approximately 0.04% of the total waste stream for NAS Jacksonville.

Hazardous wastes are accumulated at less-than-90-day satellite accumulation points throughout the station before being transferred to permitted storage facilities and are collected and stored on-site in accordance with NAS Jacksonville's RCRA Part B operating permit. The DRMO is responsible for contracting off-site disposal of most hazardous waste.

### **3.13.2 Installation Restoration Program Sites**

Hazardous waste disposal sites at NAS Jacksonville have been investigated under the DoD's Installation Restoration Program (IRP), in compliance with the requirements of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) for former waste sites and with RCRA for sites associated with continuing operations. Restoration processes have been in place at NAS Jacksonville since 1985, when environmental assessments were initiated.

Fifty-five sites designated as potential sources of contamination at NAS Jacksonville are in various stages of investigation and remediation under either the IRP or have been transferred to the Petroleum Program. There are no sites within the proposed project construction area. The two closest sites, both approximately 0.4 miles away, are a former solid waste incinerator facility and an old transformer storage area. Both of these were registered in the Navy's remedial response decision system (a Navy log on the history and progress for the sites) in 1999 and 1995 respectively.

## 4 Environmental Consequences: NAS Jacksonville

NAS Jacksonville is a site for replacing P-3C aircraft with P-8A MMA under all siting alternatives. The following is a brief summary of the aircraft replacements proposed under each alternative. As noted in Section 2.8, Alternative 5 is the preferred alternative.

- **Alternative 1:** Six fleet squadrons and a fleet replacement squadron (FRS) would be stationed at NAS Jacksonville. P-8A MMA personnel would number 1,992, representing a loss of 1,822 when compared with the number of P-3C personnel.
- **Alternatives 2, 3, and 5 (Preferred Alternative):** Five fleet squadrons and an FRS would be stationed at NAS Jacksonville. P-8A MMA personnel would number 1,785, representing a loss of 2,029 when compared with the number of P-3C personnel.
- **Alternatives 4 and 6:** Five fleet squadrons would be stationed at NAS Jacksonville. P-8A MMA personnel would number 1,476, representing a loss of 2,338 when compared with the number of P-3C personnel.

Discussions of the potential environmental impacts associated with all of the alternatives at NAS Jacksonville are included in this section. Section 1 of this EIS defines 2011 as the baseline year for the analysis presented here because it is the year prior to the introduction of the P-8A MMA. However, in a few instances the best available data were available only for an alternate year, ranging from 2010 to 2013. In such instances, where data from a year other than 2011 were used to support the analysis, the year and data source are specifically identified within the text. The baseline also defines the No Action Alternative conditions.

Tables 4-1, Table 4-2, and Table 4-3 are provided to guide the evaluation of proposed environmental impacts. The sites for the proposed new construction at NAS Jacksonville are shown on Figures 2-5 and 2-6 in Section 2, Proposed Action and Alternatives.

**Table 4-1 Baseline (2011) and Projected (2019) Personnel Loading at NAS Jacksonville**

Activity	Baseline (2011)	Alternative 1 (2019)	Alternatives 2, 3, and 5 (2019)	Alternatives 4 and 6 (2019)
P-3C Personnel	3,814	0	0	0
P-8A MMA Personnel	0	1,992	1,785	1,476
<b>Total</b>	<b>3,814</b>	<b>1,992</b>	<b>1,785</b>	<b>1,476</b>
<b>Net Change</b>	<b>–</b>	<b>(-)1,822</b>	<b>(-)2,029</b>	<b>(-)2,338</b>

**Table 4-2 Projected Area of Impact from New Construction at NAS Jacksonville**

<b>Proposed Projects</b>	<b>Alternatives 1, 2, 3, and 5</b>	<b>Alternatives 4 and 6</b>
Training Facilities	165,665 sq. ft.	93,566 sq. ft.
Size of Impact Area (footprint)	125,000 sq. ft.	71,000 sq. ft.
Privately owned vehicle (POV) Parking	103,451 sq. ft.	60,000 sq. ft.
<b>Total Acres Affected</b>	<b>9.05</b>	<b>5.16</b>

**Table 4-3 Baseline (2011) and Projected Aircraft Loading at NAS Jacksonville**

<b>Aircraft Type</b>	<b>Baseline (2011)</b>	<b>Alternative 1</b>	<b>Alternatives 2, 3, and 5</b>	<b>Alternatives 4 and 6</b>
C-40A	3	4	4	4
HH-60H	3	0	0	0
SH-60F	4	0	0	0
MH-60R	41	55	55	55
P-3C	70	3	3	3
T-34C <sup>1</sup>	2	2	2	2
C-130T	3	4	4	4
P-8A	0	48	42	30
<b>Total</b>	<b>126</b>	<b>116</b>	<b>110</b>	<b>98</b>
<b>Net Change</b>	<b>–</b>	<b>(-)10</b>	<b>(-)16</b>	<b>(-)28</b>

Note:

<sup>1</sup> T-34C to be replaced one-for-one by the T-6A in coming years

## **4.1 Airfield Operations**

The projected number of annual aircraft operations for each of the alternatives was calculated using the Patrol Reconnaissance Group Projected P-8 Syllabus Flight Operations. Based on this analysis, the number of annual operations at NAS Jacksonville is projected to decrease under all of the replacement alternatives (see Table 4-4). A key component of this decrease would be the use of simulators for training. Simulators minimize flight operations and thereby decrease air emissions and enhance safety by allowing personnel to practice emergency procedures without putting pilot and aircraft at risk.

All proposed siting alternatives would reduce projected annual air operations at NAS Jacksonville. Under Alternative 1, the existing six fleet squadrons of P-3Cs and the FRS would be replaced with six fleet squadrons of P-8A MMA and the FRS. The projected annual aircraft operations would decrease by 12,450 operations—13% fewer operations than the baseline year 2011 annual aircraft operations.

**Table 4-4 Projected (2019) Basic Operations at NAS Jacksonville**

	Baseline Total (2011)	Alternative 1			Alternatives 2, 3, and 5			Alternatives 4 and 6		
		Day (7:00 a.m. to 10:00 p.m.)	Night (10:00 p.m. to 7:00 a.m.)	Total	Day (7:00 a.m. to 10:00 p.m.)	Night (10:00 p.m. to 7:00 a.m.)	Total	Day (7:00 a.m. to 10:00 p.m.)	Night (10:00 p.m. to 7:00 a.m.)	Total
P-3C										
Departure	4,248	0	0	0	0	0	0	0	0	0
Straight-in Arrivals	4,248	0	0	0	0	0	0	0	0	0
Overhead Arrivals	113	0	0	0	0	0	0	0	0	0
Touch-and-Go	51,996	0	0	0	0	0	0	0	0	0
GCA Pattern	10,299	0	0	0	0	0	0	0	0	0
Total	70,904	0	0	0	0	0	0	0	0	0
P-3C Update <sup>1</sup>										
Departure	133	123	10	133	123	10	133	123	10	133
Straight-in Arrivals	133	123	10	133	123	10	133	123	10	133
Overhead Arrival	0	0	0	0	0	0	0	0	0	0
Touch-and-Go	1,952	1,952	0	1,952	1,952	0	1,952	1,952	0	1,952
GCA Pattern	390	390	0	390	390	0	390	390	0	390
Total	2,608	2,588	20	2,608	2,588	20	2,608	2,588	20	2,608
SH-60										
Departure	4,650	4,500	150	4,650	4,500	150	4,650	4,500	150	4,650
Straight-in Arrivals	4,650	4,500	150	4,650	4,500	150	4,650	4,500	150	4,650
Overhead Arrival	0	0	0	0	0	0	0	0	0	0
Touch-and-Go	422	410	12	422	410	12	422	410	12	422
GCA Pattern	4,250	4,122	128	4,250	4,122	128	4,250	4,122	128	4,250
Total	13,972	13,532	440	13,972	13,532	440	13,972	13,532	440	13,972
C-172										
Departure	1,135	1,100	35	1,135	1,100	35	1,135	1,100	35	1,135
Straight-in Arrivals	1,135	1,100	35	1,135	1,100	35	1,135	1,100	35	1,135
Overhead Arrival	0	0	0	0	0	0	0	0	0	0
Touch-and-Go	32	32	0	32	32	0	32	32	0	32
GCA Pattern	0	0	0	0	0	0	0	0	0	0
Total	2,302	2,232	70	2,302	2,232	70	2,302	2,232	70	2,302

# Final Environmental Impact Statement

## Introduction of the P-8A MMA into the U.S. Navy Fleet

**Table 4-4 Projected (2019) Basic Operations at NAS Jacksonville (continued)**

	Baseline Total (2011)	Alternative 1			Alternatives 2, 3,and 5			Alternatives 4 and 6		
		Day (7:00 a.m. to 10:00 p.m.)	Night (10:00 p.m. to 7:00 a.m.)	Total	Day (7:00 a.m. to 10:00 p.m.)	Night (10:00 p.m. to 7:00 a.m.)	Total	Day (7:00 a.m. to 10:00 p.m.)	Night (10:00 p.m. to 7:00 a.m.)	Total
PA-42										
Departure	605	550	55	605	550	55	605	550	55	605
Straight-in Arrivals	605	550	55	605	550	55	605	550	55	605
Overhead Arrival	0	0	0	0	0	0	0	0	0	0
Touch-and-Go	50	48	2	50	48	2	50	48	2	50
GCA Pattern	0	0	0	0	0	0	0	0	0	0
Total	1,260	1,148	112	1,260	1,148	112	1,260	1,148	112	1,260
Other Aircraft <sup>2</sup>										
Departure	2,303	2,261	42	2,303	2,261	42	2,303	2,261	42	2,303
Straight-in Arrivals	1,182	1,140	42	1,182	1,140	42	1,182	1,140	42	1,182
Overhead Arrival	1,121	1,085	36	1,121	1,085	36	1,121	1,085	36	1,121
Touch-and-Go	994	964	30	994	964	30	994	964	30	994
GCA Pattern	1,582	1,534	48	1,582	1,534	48	1,582	1,534	48	1,582
Total	7,182	6,948	744	7,182	6,948	744	7,182	6,948	744	7,182
P-8A MMA										
Departure	0	3,619	110	3,729	3,099	94	3,193	2,080	62	2,142
Arrival	0	3,619	110	3,729	3,099	94	3,193	2,080	62	2,142
Touch-and-Go	0	42,496	0	42,496	36,560	0	36,560	23,744	0	23,744
GCA Pattern	0	8,500	0	8,500	7,312	0	7,312	4,748	0	4,748
Airfield Total	97,423			85,778			77,582			60,100
Net Change	---			(-)12,450			(-)20,646			(-)37,323
Percent Net Change				(-)13%			(-)21%			(-)39%

Source: Wyle Laboratories, Inc. July 2008; Duquette 2008.

Note:

<sup>1</sup> The P-3C Update aircraft are not part of the P-8A MMA replacement action.

<sup>2</sup> Other aircraft include B-737, B-747, BE-20, C-5, C-9, C-17, C-40, C-130, E-2/C-2, EA-6, F-15, F-16, F-18, PC-9, T-34, T-45, and T-38.

Key:

GCA = Ground control approach.



The projected decrease in operations under this alternative would be the smallest decrease in operations of all the alternatives.

Alternatives 2, 3, and 5 would reduce the number of fleet squadrons to five and the FRS would remain at NAS Jacksonville. Under these alternatives, the projected annual aircraft operations would decrease from existing levels by 20,646 operations (a reduction of 21%).

Five fleet squadrons would be stationed at NAS Jacksonville under Alternatives 4 and 6, and the number of projected annual aircraft operations would be reduced from existing annual aircraft operations by a total of 37,323 (a reduction of 39%), the greatest decrease among the alternatives under consideration.

Under the No Action Alternative, there would be no change in the number of annual air operations (97,423).

The P-8A MMA squadrons would follow the same training and deployment cycle as that of the P-3C squadrons, and no change is proposed to existing types of flight operations or flight tracks. Projected operations would include arrivals, departures, touch-and-goes, and ground control approach (GCA) patterns. NAS Jacksonville meets all the operational requirements under routine operating conditions to support the airfield operations of the P-8A MMA squadrons and FRS.

## **4.2 Noise**

The noise analysis in this section is presented in two parts. First, a detailed discussion on the day-night average sound level (DNL) changes due to the replacement of the P-3C with the P-8A MMA is presented. The 24-hour DNL is a reliable measure of community sensitivity to aircraft noise and is the Federal Aviation Administration's (FAA) standard noise metric used in the United States to measure the effects of aircraft noise for both commercial airports and military installations. The DNL takes into account both the noise levels of all individual events and the number of times these events occur during a 24-hour period. The 65 decibel (dB) DNL contour is the lowest noise contour for which Navy guidance on incompatible land uses is provided. DNL noise contours have historically been used as the noise metric for NAS Jacksonville.

Secondly, in response to comments received during the draft EIS public comment period, the discussion presents an analysis of the sound exposure levels (SEL) for single-event aircraft overflights. The SEL value represents the sound energy exposure at a specific location resulting

from a specific aircraft operation. It is provided in this noise analysis to allow the reader to compare the relative difference in sound emitted by two different aircraft. A full discussion on noise modeling and the background data for this analysis are included in Appendix F.

#### **4.2.1 Day-Night Average Sound Levels (DNL) at Jacksonville**

The projected noise contours for the 65 dB DNL contours increase compared with the baseline contours under all alternatives. However, the projected noise contours for the loudest noise exposure—>75 dB DNL—remained almost entirely within the base boundaries. This is primarily due to the following factors:

- The P-8A MMA replaces the P-3C as one of the dominant noise contributors at NAS Jacksonville, and
- Although noise levels for the P-3C and P-8A MMA flight profiles are similar for takeoffs and landings (Table 4-5), noise levels for the P-8A MMA flight profiles are noticeably louder than the P-3C for touch-and-go operations (Wyle Laboratories, Inc. July 2008).

Therefore, due to the increase in the 65 dB DNL contour and projected population growth, there would be significant noise impacts for all of the alternatives at NAS Jacksonville when compared with baseline conditions.

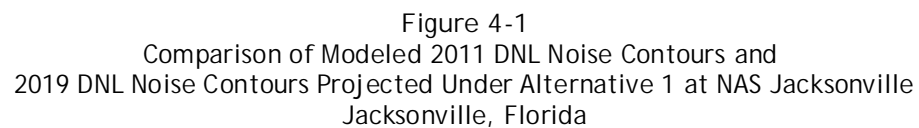
**Table 4-5 Comparative SEL (dB) for Single-Event Noise Levels for the P-3C, P-8A MMA, and the F/A-18E/F Super Hornet Aircraft**

Condition	SEL (dB) for Flyover at 1,000 feet AGL		
	P-3C	P-8A MMA	F/A-18E/F
Takeoff	94	95	117
Approach	85	87	113
Touch-and-Go – Downwind	86	94	113

Key:

AGL = Above ground level.

Projected noise contours for NAS Jacksonville under each siting alternative are shown on Figures 4-1 through 4-3. The off-station area and estimated population within projected noise contours at NAS Jacksonville for each of the replacement alternatives are shown in Table 4-6. Population estimates used in this analysis were based on 2000 U.S. census data which represents the latest consistently available data. A population growth factor of 2.1% per year was then applied to project the population to the proposed action end-state year of 2019. For comparison purposes Table 4-6 further provides the estimated population change within the modeled noise contours using only the baseline population data for 2011.



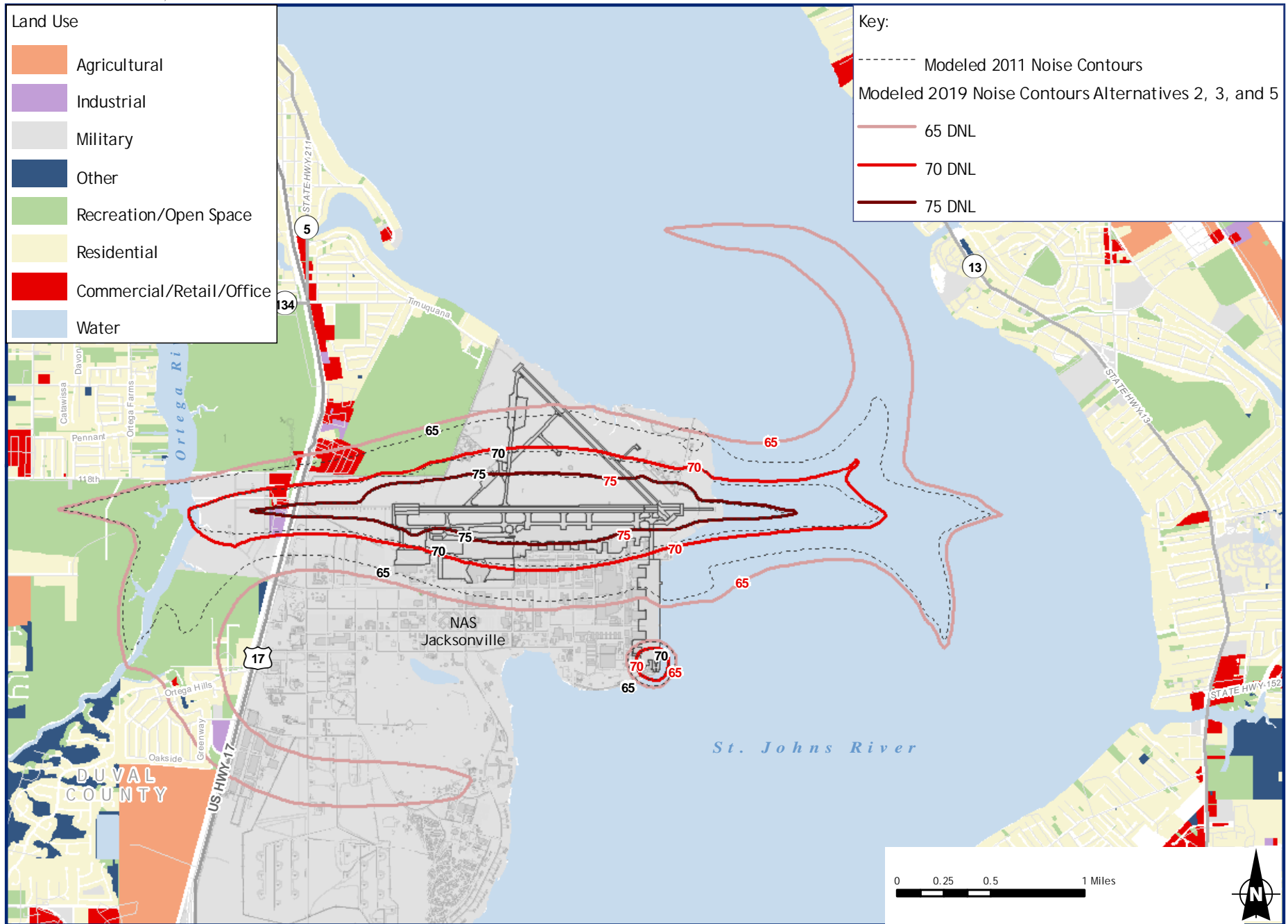


Figure 4-2  
 Comparison of Modeled 2011 DNL Noise Contours and  
 2019 DNL Noise Contours Under Alternatives 2, 3, and 5 at NAS Jacksonville  
 Jacksonville, Florida

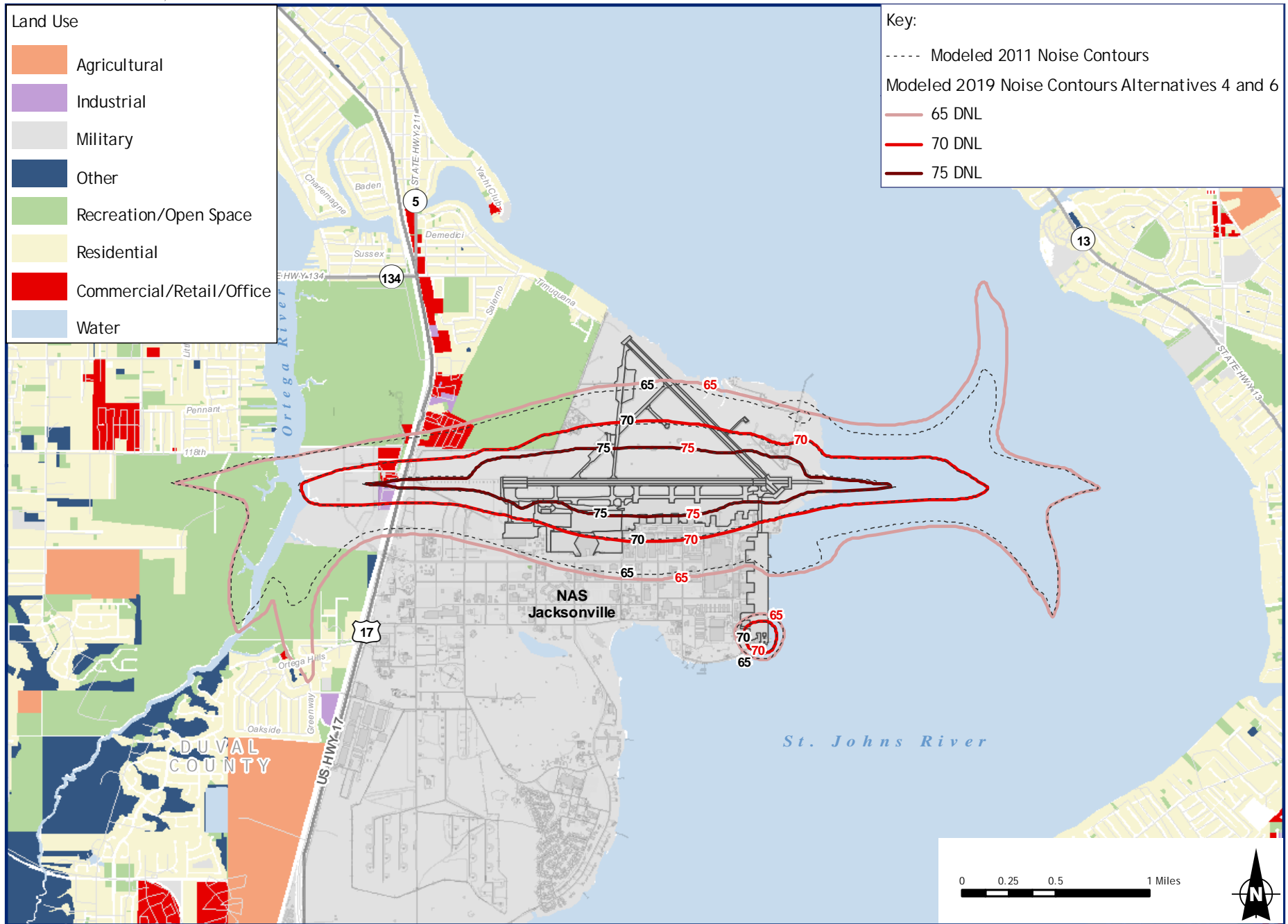


Figure 4-3  
 Comparison of Modeled 2011 DNL Noise Contours  
 and 2019 DNL Noise Contours Projected Under Alternatives 4 and 6 at NAS Jacksonville  
 Jacksonville, Florida

**Table 4-6 Off-Station Land Area (Excluding Water) and Projected Population<sup>1</sup> within Modeled 2019 Noise Contours for NAS Jacksonville**

	Baseline Population in 2011		Alternative 1 (2019)		Alternatives 2, 3, and 5 (2019)		Alternatives 4 and 6 (2019)		No Action Alternative	
	Area (acres)	Pop. <sup>1</sup>	Area (acres)	Pop. <sup>1</sup>	Area (acres)	Pop. <sup>1</sup>	Area (acres)	Pop. <sup>1</sup>	Area (acres)	Pop. <sup>1</sup>
65 to 70 dB	244	541	530	1,578	471	1,208	317	768	244	541
70 to 75 dB	26	63	35	97	33	79	27	68	26	63
75 dB or greater	5	11	6	19	5	13	2	7	5	11
<b>Total</b>	<b>275</b>	<b>615</b>	<b>571</b>	<b>1,694</b>	<b>509</b>	<b>1,300</b>	<b>346</b>	<b>843</b>	<b>275</b>	<b>615</b>
<b>Net Change</b>			<b>296</b>	<b>1,079</b>	<b>234</b>	<b>685</b>	<b>71</b>	<b>228</b>	<b>0</b>	<b>0</b>
<b>Percent Net Change (2019 population projection)</b>			<b>108%</b>	<b>175%</b>	<b>85%</b>	<b>111%</b>	<b>26%</b>	<b>37%</b>	<b>0</b>	<b>0</b>
<b>Percent Net Change (2011 population projection)</b>				<b>129%</b>		<b>76%</b>		<b>14%</b>		<b>0</b>

Source: Wyle Laboratories, Inc. July 2008; U.S. Census Bureau 2000

Note:

<sup>1</sup> Population was projected by using a yearly population growth factor of 2.1% for the city of Jacksonville.

Key:

dB = Decibels.

When considering the proposed action implementation year of 2019, Alternative 1 provides the largest increase in the >65 dB DNL noise contours, with an increase of 296 acres and 1,079 people (108% and 175% respectively). The acreage and number of people within the >65 dB DNL noise contour under Alternatives 2, 3, and 5 also increase, but the increases are slightly less than under Alternative 1 because the P-8A MMA would conduct fewer operations.

Alternatives 2, 3, and 5 result in an increase of 234 acres and 685 people (85% and 111% respectively) within the >65 dB DNL noise contours. Alternatives 4 and 6 result in the smallest increase in noise contours: 71 acres and 228 people (an increase of 26% and 37% respectively). It should be pointed out that not all of the increase in the population exposed to the >65 dB DNL is attributable to the proposed P-8A MMA operations. Approximately 17% of the increase can be attributed to the natural population growth projected for the city of Jacksonville between 2011 and 2019. With the population projection held constant at 2011 values, the increases in the population within the modeled >65dB DNL noise contours would be 129% for Alternative 1, 76% for Alternatives 2,3, and 5, and 14% for Alternatives 4 and 6. Further discussion of the compatibility of land uses within the projected noise zones for each alternative is included in Section 4.3.4.

#### **4.2.2 Sound Exposure Level Analysis**

Although the DNL is the standard metric for expressing aircraft noise impacts, in response to comments received on the draft EIS, this document provides a discussion of the single-event noise level analysis. As outlined in Section 3.2, the SEL (as opposed to the DNL, which represents a 24-hour average noise metric) is a composite metric representing both the intensity of a sound and its duration. The SEL shows the effect of an individual noise event such as an aircraft overflight. Table 4-5 shows the comparative difference in SEL noise values for the P-3C and the P-8A MMA. The F/A-18E/F is also shown in Table 4-5 because of its influence on the noise environment at NAS Jacksonville.

The P-3C, as a turboprop, and the P-8A MMA, as a jet aircraft, generally have different noise characteristics. For example, the P-8A MMA exhibits more noise in some higher frequency bands during approach (2,500 hertz [Hz] to 5,000 Hz) than the P-3C and, as a result, while the overall sound energy of the two aircraft is similar, people on the ground will likely detect the “whine” from the P-8A MMA turbofan engines during approach operations. However, the actual increase in total sound energy at a distance of 1,000 feet during approach operations for a P-8A MMA would range only from 1 dB to 2 dB. A larger difference in SEL noise values can be found when comparing touch-and-go operations. In this case the P-8A MMA is on average about 8 dB louder than the P-3C. Therefore, the population at or in the immediate vicinity of NAS Jacksonville would be exposed to higher single-event noise levels during P-8A MMA touch-and-go operations, compared with current operations completed by P-3C aircraft (Wyle Laboratories, Inc. July 2008).

#### **Points of Interest Noise Analysis**

Noise exposures at selected locations in the vicinity of NAS Jacksonville were analyzed for single-event noise levels. The Navy identified four locations within the surrounding communities and near NAS Jacksonville as points of interest to the community. The locations were selected based on comments received during the draft EIS public comment period and were chosen to represent public areas in the vicinity of NAS Jacksonville. (Note that the modeled sound is representative only for each individual location and does not provide a representative measure of the sound heard during aircraft overflights in other areas.) These locations are listed in Table 4-7 and are shown on Figure 4-4.



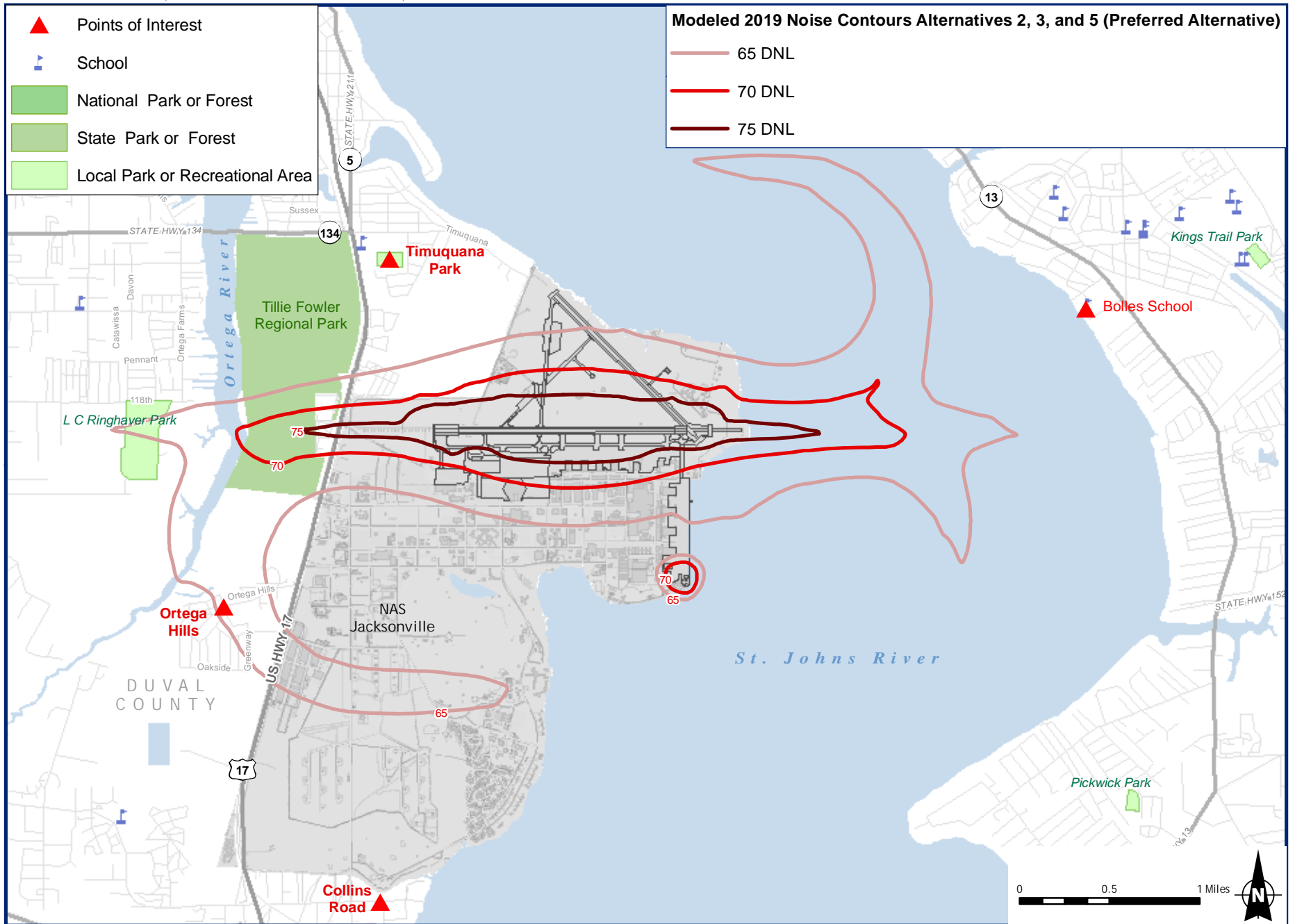


Figure 4-4  
 Points of Interest in the Vicinity of NAS Jacksonville, Florida



**Table 4-7 Highest SEL Value (dB) for Modeled Aircraft Operations at Points of Interest for all Alternatives**

Point of Interest	F/A-18E/F	P-3C	P-8A MMA
Ortega Hills Drive	108.9	91.8	100.3
Collins Road	94.6	81.8	86.6
Timuquana Park	101.7	76.5	87.3
Bolles High School	100.2	74.5	85.1

Table 4-7 shows the loudest operations for the F/A-18E/F, P-3C, and P-8A MMA at four different locations in the vicinity of NAS Jacksonville. The noise exposure for each aircraft operation at each location is represented by the SEL. For example, Table 4-7 shows that the loudest operation, at Ortega Hills Drive, would be an F/A-18E/F at 108.9 dB SEL, followed by a P-8A MMA at 100.3 and a P-3C at 91.8 dB SEL. As discussed in Section 3.2, an increase in the SEL of 5 dB to 10 dB can be perceived as a quite noticeable to dramatic increase in single-event noise levels. A result of the proposed P-8A MMA touch-and-go operations would be a significant increase in single-event noise exposure to the population living in the areas near the points of interest. Increases in SEL noise values for the P-8A touch-and-go operations range from approximately 5 dB SEL at Collins Road to approximately 8.5 dB SEL at Ortega Hills Drive to approximately 11 dB SEL for both the Timuquana Park and the Bolles High School location.

### **4.3 Land Use**

#### **4.3.1 NAS Jacksonville Land Use**

To base five or six fleet squadrons and the FRS at NAS Jacksonville, the Navy would need to construct a training facility and an associated parking area for privately owned vehicles (POVs). The new construction space needed to support the P-8A MMA squadrons under each of the replacement alternatives is provided in Table 4-2 above. (Locations of the proposed construction projects are shown on Figures 2-5 and 2-6 in Section 2, Proposed Action and Alternatives.) On-station land use would change only minimally under all replacement alternatives. The site of the training facility is currently vacant land designated for personnel/community services. The land-use designation of the site would change to “training,” which would be compatible with surrounding land uses on the station.

Under the No Action Alternative no additional facilities would be constructed to support the current operations of P-3C aircraft; therefore, no changes in on-station land use would occur.

#### **4.3.2 Regional Land Use**

The proposed new construction and personnel transitions under each replacement alternative at NAS Jacksonville would have minor impacts on regional land use. All project-related construction would occur within the boundaries of NAS Jacksonville and would not result in land-use conflicts with off-station land uses. The proposed action would not result in any indirect growth-induced development under any of the replacement alternatives because the number of personnel stationed at NAS Jacksonville would decrease. The largest decrease in personnel (Alternatives 4 and 6) would represent only about 0.5% of the total projected population of the city of Jacksonville. Considering the projected growth rate for the city of Jacksonville of 22%, the decrease in personnel is not anticipated to result in any residential or business foreclosures or abandonment of residential, commercial, or office establishments that would significantly impact existing land use patterns.

The projected noise zones under each of the alternatives would extend over land not previously contained within the modeled 2011 noise zones for NAS Jacksonville. A land-use compatibility assessment of the replacement alternatives is included below in Section 4.3.4.

Under the No Action Alternative no new construction or personnel transitions would occur; therefore, regional land use would not be affected.

#### **4.3.3 Land-Use Controls**

The proposed action has been evaluated relative to the following land-use controls:

- The Navy and Marine Corps Air Installations Compatible Use Zones (AICUZ) Program;
- The 2003 Regional Shore Infrastructure Plan (RSIP) for the Jacksonville Fleet Concentration Area (FCA);
- The 2005 NAS Jacksonville Integrated Natural Resources Management Plan (INRMP);
- The City of Jacksonville 2010 Comprehensive Land Use Plan;
- The 2007 City of Jacksonville zoning ordinances; and
- The Florida Coastal Management Program (FCMP).

### **AICUZ Program**

**Noise.** Under all of the proposed replacement alternatives, the geographic extent of the noise contours would change. Therefore, the Navy will consider the need to update the NAS Jacksonville AICUZ Report (see <http://maps.coj.net/jaxgis> for the current NAS Jacksonville AICUZ noise footprint).

**APZs.** Accident potential zones (APZs) around an air station are identified based on the number and type of airfield operations and the flight tracks. Although the projected number of airfield operations at NAS Jacksonville would be reduced compared with baseline conditions, the flight tracks would remain the same when the P-8A MMA replaces the P-3C. Consequently, the baseline APZs at NAS Jacksonville as shown in the station's current AICUZ would not change under any of the replacement alternatives.

The No Action Alternative would have no effect on the current AICUZ Program because current aviation activities at NAS Jacksonville would continue unchanged.

### **Regional Shore Infrastructure Plan (RSIP) Overview for the Jacksonville Fleet Concentration Area (FCA)**

Implementation of any of the replacement alternatives at NAS Jacksonville would be consistent with the goals and objectives of the RSIP Overview for the Jacksonville FCA. Basing the P-8A MMA at NAS Jacksonville would not conflict with any of the structural improvements or replacements proposed within the plan for the airfield complex. The location of the proposed training facility and parking area would fit the land-use model of the RSIP in that it locates aircraft training facilities next to the airfield. In addition, the proposed site is not located in any area identified in the RSIP as having development constraints.

Implementation of the No Action Alternative would not be compatible with the goal of the RSIP to support the long-range vision for the Navy's presence in the Jacksonville FCA.

### **Integrated Natural Resources Management Plan (INRMP)**

The proposed action would be consistent with management objectives designed to protect and preserve the mission of NAS Jacksonville and all on-station natural resources. Implementation of the replacement alternatives would be consistent with the station's management practices currently being implemented under the INRMP. The proposed site for the training facility and

parking area is largely maintained lawn and construction of these facilities would result in minimal loss of natural areas at the station.

Under the No Action Alternative natural resources at NAS Jacksonville would not be affected.

### **City of Jacksonville 2010 Comprehensive Plan**

The city of Jacksonville's 2010 Comprehensive Plan influences land-use development patterns around NAS Jacksonville. The plan supports and encourages an expanded economic base, including expansion of NAS Jacksonville. In addition, the plan recognizes the Navy's AICUZ Program and recommends land-use development that is compatible with aircraft operations. The Navy would continue to work with the city of Jacksonville to plan for compatible land-use development within the projected noise zones under all basing alternatives at NAS Jacksonville.

The No Action Alternative would have no effect on city of Jacksonville planning because current aviation activities at NAS Jacksonville would continue unchanged.

### **City of Jacksonville Zoning Ordinances**

The proposed action would not require amending the existing city of Jacksonville zoning ordinance. The city regulates residential development and other related uses such as churches, schools, and hospitals within Noise Zone A (70 dB DNL or greater) and within the APZs to maintain compatibility with aircraft operations at NAS Jacksonville. Under all of the proposed alternatives, the amount of residential land or other related uses within Noise Zone A would not change (see Section 4.3.4 for further discussion of land uses and zoning within projected noise zones). In addition, as previously discussed, the baseline APZs at NAS Jacksonville as shown in the current AICUZ study for NAS Jacksonville would not change under any of the replacement alternatives.

The No Action Alternative would have no effect on the city of Jacksonville zoning ordinances because current aviation activities at NAS Jacksonville would continue unchanged.

### **Federal Consistency with the Florida Coastal Zone Management Program**

Based on a comprehensive coastal consistency program and policy analysis, the Navy has determined that the proposed action would be consistent to the maximum extent practicable with

applicable enforceable coastal zone policies of the federally approved Florida Coastal Zone Management Program. A copy of the Navy's Coastal Consistency Determination (CCD) is included in Appendix J.

#### **4.3.4 Land-Use Compatibility Assessment**

Proposed aircraft operations associated with replacement of the P-3C with the P-8A MMA would result in additional land area within the greater-than-65 dB DNL noise zones than the baseline. An analysis was conducted to determine whether proposed aircraft operations would be incompatible with existing land use within the city of Jacksonville. This was accomplished by overlaying maps of the projected noise zones under each siting alternative on existing land-use maps for Jacksonville (see Figures 4-1, 4-2, and 4-3).

Tables 4-8, 4-9, and 4-10 show the types of land uses around NAS Jacksonville that would be affected by the proposed action. In summary, when compared with baseline conditions, replacing the P-3C with the P-8A MMA would result in a 61% overall increase in the acreage of land and water within the projected greater-than-65 dB DNL noise zones under Alternative 1; a 47% increase under Alternatives 2, 3, and 5; and a 12% increase under Alternatives 4 and 6.

**Table 4-8 Net Change in Area within the Projected Greater-than-65 dB DNL Noise Zones around NAS Jacksonville under Alternative 1**

<b>Land Use</b>	<b>Total Area 2011 Baseline (acres)</b>	<b>Total Area Alternative 1 (acres)</b>	<b>Net Change (acres)</b>	<b>% Net Change</b>
Residential	0	59	59	>100
Commercial/Retail/Office	24	34	10	41
Industrial	8	15	7	88
Recreation/Open Space	223	392	169	76
Transportation/Utilities	19	165	146	768
Military	1,194	1,586	392	33
Water	578	1,053	475	82
<b>Total</b>	<b>2,046</b>	<b>3,304</b>	<b>1,258</b>	<b>61</b>

**Table 4-9 Net Change in Area within the Projected Greater-than-65 dB DNL Noise Zones around NAS Jacksonville under Alternatives 2, 3, and 5**

Land Use	Total Area 2011 Baseline (acres)	Total Area Alternatives 2, 3, and 5 (acres)	Net Change	
			(acres)	% Net Change
Residential	0	41	41	>100
Commercial/Retail/Office	24	33	9	37
Industrial	8	15	7	88
Recreation/Open Space	223	365	142	64
Transportation/Utilities	19	99	80	421
Military	1,194	1,502	308	26
Water	578	960	382	66
<b>Total</b>	<b>2,046</b>	<b>3,015</b>	<b>969</b>	<b>47</b>

**Table 4-10 Net Change in Area within the Projected Greater-than-65 dB DNL Noise Zones around NAS Jacksonville under Alternatives 4 and 6**

Land Use	Total Area 2011 Baseline (acres)	Total Area Alternatives 4 and 6 (acres)	Net Change	
			(acres)	% Net Change
Residential	0	9	9	>100
Commercial/Retail/Office	24	26	2	2
Industrial	8	8	0	0
Recreation/Open Space	223	280	57	26
Transportation/Utilities	19	25	6	32
Military	1,194	1,251	57	5
Water	578	701	123	21
<b>Total</b>	<b>2,046</b>	<b>2,300</b>	<b>254</b>	<b>12</b>

Residential land use is the primary “conditionally compatible” and “incompatible” land use (see Appendix G). Although some residences are located within the baseline noise zones at NAS Jacksonville, no residential land use has been designated within the greater-than-65 dB DNL by the city of Jacksonville. Under Alternative 1, 59 acres of residential land would be located within the projected greater-than-65 dB DNL noise zones; 41 acres of residential land would be within these noise zones under Alternatives 2, 3, and 5; and 9 acres of residential land would be affected under Alternatives 4 and 6. All of the affected land use under each of the alternatives would be within the 65 to 70 dB DNL noise zone; therefore, no residential areas would be exposed to noise levels greater than 70 dB DNL.

The projected increase in residential land use within the greater-than-65 dB DNL noise zone under each of the alternatives occurs immediately west of U.S. Highway 17 in the community of Ortega Hills.

The No Action Alternative, represented as the baseline conditions in Tables 4-8, 4-9, and 4-10, would have no effect on land-use compatibility because current aviation activities at NAS Jacksonville would continue unchanged.

## **4.4 Air Quality**

Air quality impacts associated with the proposed action are related to emissions from short-term construction activities, long-term aircraft operations, and personnel commuting changes.

Construction may affect air quality primarily as a result of construction equipment emissions, paving and painting emissions, and fugitive dust from grading and earthmoving. These emissions are calculated separately from operational emissions because they are temporary and would occur before full implementation of the chosen action. New operational emissions would result from the flight operations of the P-8A MMA and commuting activities of new station personnel. Because these new emissions would be offset by decreased emissions as a result of the discontinued use of the P-3C aircraft, the *total changes* in emissions have been evaluated. Other site emissions, such as those from stationary sources, other aircraft, ground support equipment (GSE), and other sources, are assumed to remain constant under this action. Cumulative impacts are discussed in Section 11.

### **4.4.1 Construction Emissions**

Table 4-11 provides information regarding estimated new construction at NAS Jacksonville under all alternatives. Construction emissions have been estimated using guidelines published by the El Dorado County, California Air Pollution Control District (APCD) California Environmental Quality Act (CEQA) Guide (February 2002) and the U.S. Environmental Protection Agency's (EPA) AP-42 (1995), based on estimates of equipment to be used, on average, throughout the year, assuming a one-year construction period and 250 workdays per year. A workday is assumed to be eight hours long. Particulate emissions from site activities are also considered. Total projected annual construction emissions in tons per year (tpy) at NAS Jack-

sonville under each alternative are listed in Table 4-11. The construction equipment, activities, emission factors, and calculations are detailed in Appendix H.

**Table 4-11 Construction Emissions at NAS Jacksonville, All Alternatives**

Activity	Emissions (tpy)			
	NO <sub>x</sub>	VOC	CO	PM <sub>10</sub>
<b>Alternatives 1, 2, 3, and 5</b>				
Construction equipment	39.01	4.11	25.32	2.05
VOCs from paving and painting		5.20		
PM <sub>10</sub> from grading and demolition				0.78
<b>Total</b>	<b>39.01</b>	<b>9.31</b>	<b>25.32</b>	<b>2.83</b>
<b>Alternatives 4 and 6</b>				
Construction equipment	31.94	3.38	20.89	1.68
VOCs from paving and painting		2.95		
PM <sub>10</sub> from grading and demolition				0.45
<b>Total</b>	<b>31.94</b>	<b>6.33</b>	<b>20.89</b>	<b>2.13</b>

Key:

CO = Carbon monoxide.

NO<sub>x</sub> = Nitrogen oxides.

PM<sub>10</sub> = Particulate matter less than 10 microns in diameter.

tpy = Tons per year

VOCs = Volatile organic compounds.

#### 4.4.2 Mobile Source Emissions

Mobile source emissions considered in this analysis include P-8A MMA flight and maintenance operations and POVs operated by the new station personnel. Aircraft operation emission totals and the change in emission totals for aircraft and POVs that would result from this action are listed in Table 4-12. Emission factors and calculations are detailed in Appendix H.

**Table 4-12 P-8A MMA Emissions NAS Jacksonville, All Alternatives**

Flight Operation	No. of Operations <sup>1</sup>	Baseline Emissions (tpy) <sup>2</sup>				
		CO	NO <sub>x</sub>	HC	SO <sub>2</sub>	PM <sub>10</sub>
Alternative 1 (48 aircraft)						
Straight-In Arrival LTOs	3,729	31.6	55.8	3.3	5.1	1.6
Touch-and-Go	21,248	2.0	67.1	0.3	1.2	1.7
GCA Pattern	4,250	1.1	9.1	0.3	0.4	0.5
Maintenance Run-Ups		0.010	0.070	0.001	0.003	0.002
Total P-8A MMA Flight Ops Emissions		34.8	132.1	3.8	6.7	3.8
Baseline P-3C Emissions		128.0	154.8	79.2	7.9	71.7
Change in Aircraft Emissions		(-)93.2	(-)22.7	(-)75.3	(-)1.2	(-)67.9
Change in POV Emissions		(-)40.4	(-)4.1	(-)4.2	(-)0.1	(-)0.5
Total Change in Mobile Operations Emissions		(-)133.6	(-)26.8	(-)79.5	(-)1.3	(-)68.4
Alternatives 2, 3, and 5 (42 aircraft)						
Straight-In Arrival LTOs	3,193	27.0	47.8	2.8	4.3	1.4
Touch-and-Go	18,280	1.8	57.7	0.3	1.1	1.4
GCA Pattern	3,656	1.0	7.8	0.2	0.3	0.5



**Table 4-12 P-8A MMA Emissions NAS Jacksonville, All Alternatives (continued)**

Flight Operation	No. of Operations <sup>1</sup>	Baseline Emissions (tpy) <sup>2</sup>				
		CO	NO <sub>x</sub>	HC	SO <sub>2</sub>	PM <sub>10</sub>
Maintenance Run-Ups		0.009	0.061	0.001	0.002	0.002
<b>Total P-8A MMA Flight Ops Emissions</b>		<b>29.8</b>	<b>113.4</b>	<b>3.3</b>	<b>5.7</b>	<b>3.3</b>
Baseline P-3C Emissions		128.0	154.8	79.2	7.9	71.7
Change in Aircraft Emissions		(-)98.2	(-)41.4	(-)75.9	(-)2.1	(-)68.4
Change in POV Emissions		(-)45.0	(-)4.5	(-)4.7	(-)0.1	(-)0.6
<b>Total Change in Mobile Operations Emissions</b>		<b>(-)143.2</b>	<b>(-)45.9</b>	<b>(-)80.6</b>	<b>(-)2.2</b>	<b>(-)69.0</b>
<b>Alternatives 4 and 6 (30 aircraft)</b>						
Straight-In Arrival LTOs	2142	18.1	32.1	1.9	2.9	0.9
Touch-and-Go	11872	1.1	37.5	0.2	0.7	0.9
GCA Pattern	2374	0.6	5.1	0.1	0.2	0.3
Maintenance Run-Ups		0.006	0.044	0.000	0.002	0.001
<b>Total P-8A MMA Flight Ops Emissions</b>		<b>19.9</b>	<b>74.7</b>	<b>2.2</b>	<b>3.8</b>	<b>2.1</b>
Baseline P-3C Emissions		128.0	154.8	79.2	7.9	71.7
Change in Aircraft Emissions		(-)108.1	(-)80.1	(-)77.0	(-)4.0	(-)69.5
Change in POV Emissions		(-)51.8	(-)5.2	(-) 5.4	(-) 0.1	(-) 0.7
<b>Total Change in Mobile Operations Emissions</b>		<b>(-)159.9</b>	<b>(-)85.3</b>	<b>(-)82.4</b>	<b>(-)4.1</b>	<b>(-)70.2</b>

Notes:

<sup>1</sup> Operations information from Wyle Laboratories, Inc. July 2008.

<sup>2</sup> Emissions calculated using emission factors from the International Civil Aviation Organization (July 2007) and the Federal Aviation Administration (June 29, 2007) (see Appendix H).

Key:

(-) = Reduction in absolute value.

CO = Carbon monoxide.

HC = Hydrocarbons.

NO<sub>x</sub> = Nitrogen oxides.

PM<sub>10</sub> = Particulate matter less than 10 microns in diameter.

SO<sub>2</sub> = Sulfur dioxide.

tpy = Tons per year.

Emissions of P-8A MMA flight operations and maintenance operations are based upon emission indexes developed by the International Civil Aviation Organization (ICAO) for the CFM56-7B26 engine, which will be used in the P-8A MMA (International Civil Aviation Organization July 2007). Time-in-mode assumptions for landing and take-off cycles (LTOs) are taken from the FAA Emissions and Dispersion Modeling System (EDMS) (Federal Aviation Administration June 29, 2007), which provides default time-in-mode values for the Boeing 737-800 series aircraft. These references were used to provide emission data because P-8A MMA data from the Aircraft Environmental Support Office (AESO) are not available at this time (see Appendix H for emission calculations). Time-in-mode assumptions for touch-and-go and GCA box operations are adapted from P-3C time-in-mode assumptions from the AESO (Aircraft Environmental Support Office 2000). Emissions from POVs were estimated based on the California Air Resources Board's emission factors model (EMFAC) 2007—which provides conservative

values for vehicle emissions—and on changes in personnel estimates (California Air Resources Board March 27, 2007). These are summarized in Table 4-12.

#### **4.4.3 Air Quality Impacts**

Total annual emissions from construction and operations for each alternative are summarized in Tables 4-11 and 4-12, above. The Conformity Rule does not apply to the implementation of this action because NAS Jacksonville is located in regions that are in attainment for all criteria emissions. Should the city of Jacksonville be classified as a non-attainment area during the replacement period (2012-2019), any of the alternatives selected would be deemed to conform to the SIP because of the net reduction in air pollutants from the baseline year. Prevention of Significant Deterioration (PSD) standards establish thresholds of 250 tpy for criteria pollutants for major stationary emissions sources, and although mobile and temporary emissions are not subject to these standards, they provide an adequate threshold to evaluate the significance of an action. Temporary construction total annual emissions would be below 250 tpy for all criteria pollutants, and estimates of projected operating emissions predict a decrease in annual emissions.

Under the No Action Alternative, operations of the P-3C and staff levels would remain the same as baseline conditions, resulting in no change to air quality emission totals or conditions.

### **4.5 Socioeconomics**

#### **4.5.1 Population and Housing**

##### **4.5.1.1 Population: Alternatives 1 through 6**

Under all of the proposed alternatives associated with this action, the number of personnel stationed or employed at NAS Jacksonville would decrease. Table 4-13 shows the projected personnel loading (i.e., the number of military, civilian, and contractor personnel) at NAS Jacksonville under each of the alternatives.

Overall, fewer military personnel per P-8A MMA squadron are required than per P-3C squadron because fewer crew members per aircraft would be needed and fewer support personnel would maintain and service the aircraft. Contractor support personnel would provide basic

maintenance, preventive maintenance, inspections, servicing/replacement of various aircraft components, and specialized repair of inoperative components.

**Table 4-13 Projected Change in Regional Population Resulting from P-8A MMA Personnel Transition to NAS Jacksonville**

	<b>Alternative 1</b>	<b>Alternatives 2, 3, and 5</b>	<b>Alternatives 4 and 6</b>
<b>NAS Jacksonville/City of Jacksonville</b>			
City of Jacksonville Projected 2011 Population	914,061	914,061	914,061
<b>MMA Personnel Change</b>			
Military	(-)2,391	(-)2,549	(-)2,659
Civilian and Contractor	569	520	321
<b>Total P-8A MMA Personnel<sup>1</sup></b>	<b>(-)1,822</b>	<b>(-)2,029</b>	<b>(-)2,338</b>
<b>Dependents Change</b>			
Military Dependents	(-)4,745	(-)5,078	(-)5,310
Civilian/Contractor Dependents	1,172	1,071	661
<b>Total Dependents</b>	<b>(-)3,573</b>	<b>(-)4,007</b>	<b>(-)4,649</b>
<b>Total Population Gain/(Loss)</b>	<b>(-)5,395</b>	<b>(-)6,036</b>	<b>(-)6,987</b>
<b>Population Gain/(Loss) as a Percent of 2011 City of Jacksonville Population</b>	<b>(-)0.6%</b>	<b>(-)0.7%</b>	<b>(-)0.8%</b>

Note:

<sup>1</sup> The exact mix of military/contractor personnel could vary slightly.

Depending on the net changes in personnel for each alternative, it is assumed that military personnel and their dependents (e.g., spouses and children) would have to move or leave the region to relocate to other Navy installations. The number of military dependents affected by the proposed action was calculated using a national Navy/Marine Corps average for the percentage of married enlisted personnel and officers, by rank, and the average number of children by their parents' rank (see *Facility Planning Criteria for Navy and Marine Corps Shore Installations, NAVFAC P-80*). These average percentages were applied to the number of enlisted personnel and officers who would be relocating under each of the alternatives to determine the corresponding number of dependents who would be affected (see Table 4-13).

The number of non-military dependents (e.g., dependents of civilians and contractors employed by NAS Jacksonville) who would be affected by the proposed action was calculated using the average family size for the city of Jacksonville according to the 2005 American Community Survey (U.S. Census Bureau 2005). The average family size for the city of Jacksonville was 3.06; one person (the civilian or contractor) was subtracted from that number, producing an average of 2.06 dependents per family. This average was then applied to the number of contrac-

tors and civilians who would be assumed to relocate to determine the corresponding number of dependents who would be affected by the various alternatives (see Table 4-13). In addition, the population impacts are believed to be conservative in comparison with the estimated 2010 population numbers for the local municipality because the personnel and squadron transition would actually occur sometime after 2010 and be implemented as a rolling transfer. Thus, there would be no sudden change in the local population but, rather, a gradual adjustment over several years. This combination of factors would minimize any impacts associated with personnel transitioning.

The total loss in population under each alternative is not significant as a percentage of the total population of the city of Jacksonville. As seen in Table 4-13, there are three potential population-loss scenarios, which range from a loss of 0.6% to 0.8%. The small percentage of population lost under these alternatives is not considered a significant impact, especially with the overall growth that the Jacksonville metropolitan area has experienced and is projected to experience in future years.

#### **4.5.1.2 Housing: Alternatives 1 through 6**

The relatively small change in the overall population of the city of Jacksonville that would occur with implementation of any the proposed alternatives (0.8% or less) would not significantly affect the Jacksonville housing market. Existing housing vacancy rates in the area are close to 8%; however, at a population and housing inventory growth of more than 20% (2011 to 2019) any vacancies created by military-related jobs moving out of the area would be quickly filled. In addition, most of the personnel who would relocate out of the area under the proposed action would be military personnel and their dependents, many of whom currently reside in Navy family housing or bachelor quarters.

#### **4.5.1.3 No Action Alternative**

Under the No Action Alternative, the P-3C would not replace the P-8A MMA and, thus, no change in required personnel would occur. The existing base and regional population would not be directly impacted by the Navy action and, as a result, there would be no impact on housing.

## **4.5.2 Economy**

### **4.5.2.1 Alternatives 1 through 6**

The proposed action would impact the regional economy in two ways. First, under all alternatives, there would be a short-term, positive effect from funds injected into the regional economy through expenditures on the new construction and renovation projects that would be required to support the P-8A MMA squadrons. However, there would also be a long-term, negative impact on the regional economy, primarily attributable to the loss of payroll and other station expenditures supporting businesses and services within the Jacksonville region. The one-time construction expenditures would not offset the recurring or annual loss in payroll and other station expenditures associated with replacing the P-3C aircraft with P-8A MMA squadrons.

In order to quantify the total impact of the proposed alternatives on the regional economy, the Navy used regional input-output modeling system (RIMS II) multipliers. These multipliers are based on regional information derived from databases analyzing commercial, industrial, and household spending patterns and relationships. These multipliers also estimate the potential number of jobs created or lost as a result of changes in earning and spending patterns. Both one-time, short-term construction-related economic impacts and annual, long-term operational spending impacts are discussed below.

### **Short-Term Construction-Related Impacts**

Transitioning from the P-3C to the P-8A MMA would require upgrading, renovating, or constructing new facilities at NAS Jacksonville to accommodate the aircraft squadrons, personnel, and contractors. Table 4-14 lists the construction costs under the alternative scenarios at NAS Jacksonville. Major costs for new training facilities would include more than \$48 million for an Integrated Training Center (Alternatives 1, 2, 3, and 5) and more than \$31 million for a Fleet Training Center (Alternatives 4 and 6).

The specific years of construction would vary, depending on the alternative and transition scenario. These construction activities would generate a number of jobs during the construction period and contribute to local income and indirect spending. Potential impacts associated with the proposed construction projects would include the creation of between 632 and 955 jobs, depending on the alternative chosen. Table 4-15 presents the multiplicative economic impacts of construction spending and an estimate of jobs created through this increase in spending.

**Table 4-14 Cost of Construction at NAS Jacksonville (FY 2011 dollars)**

<b>Construction Component</b>	<b>Alternatives 1, 2, 3, and 5</b>	<b>Alternatives 4 and 6</b>
Tactical Support Center/Mobile Operations Control Center	\$2,083,549	\$2,083,549
Integrated Training Center	\$48,039,635	NA
Fleet Training Center	NA	\$31,736,639
Contractor Logistics Support	\$2,854,749	\$2,497,450
Aircraft Washrack	\$197,168	\$197,168
Aircraft Rinse Facility	\$81,146	\$81,146
Compass Calibration Pad	\$61,725	\$61,725
<b>Total Construction Costs</b>	<b>\$53,317,972</b>	<b>\$36,657,677</b>

**Table 4-15 Regional Economic Impact Resulting from Proposed Renovation and Construction Projects (One-Time Costs) at NAS Jacksonville (FY 2011 Dollars)**

	<b>Alternatives 1, 2, 3, and 5</b>	<b>Alternatives 4 and 6</b>
<b>Direct Economic Impacts</b>		
Expenditures (\$ million)	<b>\$53.3</b>	<b>\$36.7</b>
<b>Multiplied Economic Impacts</b>		
Expenditures (\$ million)	\$114.5	\$78.7
<b>Total Economic Impacts</b>		
Expenditures (\$ million)	<b>\$167.8</b>	<b>\$115.4</b>
<b>Employment Impacts</b>		
Employment (jobs)	955	657

The positive economic impacts of construction would last only a short time because construction dollars represent a one-time expenditure. Once these funds leave the region through savings, taxes, or purchases of goods and services outside the region, the positive effects would no longer be multiplied.

### **Long-Term Earning and Spending Impacts**

Transitioning from the P-3C to the P-8A MMA would require personnel with different training to operate and maintain the aircraft and provide necessary support services. Table 4-16 summarizes projected changes in employment and payroll at NAS Jacksonville under each of the alternative scenarios and the estimated regional economic impact that would result from the loss in annual or recurring spending of disposable income. Personnel and payroll under all alternatives at NAS Jacksonville would be reduced; however, more specifically, a small increase in contractor/civilian personnel would be offset by a larger decrease in military personnel and would

result in a negative net change. Military personnel typically have a slightly different spending pattern than civilians and contractors because of programs offered by the military such as housing, base exchange, health care, etc.; however, for the purposes of this analysis, spending earned income by civilians and military is assumed to be the same and has been combined.

**Table 4-16 Regional Economic Impact (Annual) Resulting from Projected Change in Employment and Disposable Income at NAS Jacksonville (FY 2011 dollars)**

	<b>Alternative 1</b>	<b>Alternatives 2, 3, and 5</b>	<b>Alternatives 4 and 6</b>
<b>Direct Impacts</b>			
Employment (jobs)	(-)1,822	(-)2,029	(-)2,338
Total earnings (\$ million)	(-)128.7	(-)146.7	(-)168.5
<b>Multiplied Impacts</b>			
Employment (jobs)	(-)1,017	(-)1,159	(-)1,332
Earnings (\$ million)	(-)122.1	(-)139.2	(-)159.9
<b>Total Impacts</b>			
Employment (jobs)	(-)2,839	(-)3,188	(-)3,670
Earnings (\$ million)	(-)250.8	(-)285.9	(-)328.4

Payroll expenditures were calculated for all personnel relocating from the area or transitioning into the area under each of the alternatives. The change in direct payroll for personnel stationed or employed at NAS Jacksonville is shown in Table 4-16. All alternatives would result in a loss of earned income in the region directly related to the military, ranging from approximately \$128.7 million under Alternative 1 to \$168.5 million under Alternatives 4 and 6.

The reduction in personnel employed by NAS Jacksonville would result in an annual reduction in the personal income earned by residents in the region, residents who subsequently spend a portion of their disposable income in the local community. The multiplied and total effect of the loss in regional earned income is also presented in Table 4-16. This was calculated using RIMS II multipliers for average household spending in the region, based on changes in disposable income. (Taxes and savings were assumed to take 30% of payroll earnings, resulting in the disposable income used in the analysis.)

The loss in personnel and payroll expenditures at NAS Jacksonville under Alternatives 4 and 6 would have the most significant regional economic impact, with a combined loss of 3,670 direct and indirect jobs and a total loss of earnings of more than \$328 million. Total personal income earned in 2005 for Duval County was \$27.9 billion (U.S. Department of Commerce Au-

gust 7, 2007). In 2011 dollars this amount would be approximately \$31.8 billion; thus, the loss of personal income resulting from Alternatives 4 and 6 would represent 1.0% of the total personal income earned in Duval County.

Despite a positive economic impact from construction spending associated with these alternatives, it is apparent that the large, annual reduction in earnings from the loss in jobs would outweigh the positive effects of the construction. Alternatives 4 and 6 would have the largest negative economic impact on the region around NAS Jacksonville, followed by Alternatives 2, 3, and 5. Alternative 1 would have the least negative economic impact but would still result in a decrease in local earnings.

#### **4.5.2.2 No Action Alternative**

Under the No Action Alternative, the P-8A MMA would not replace the P-3C and, thus, no change in personnel would occur. The base payroll would remain as it is now and there would be no impact on the disposable income available in the local region as a result of a Navy action.

#### **4.5.3 Taxes and Revenues**

Under all alternatives in this proposed action, the number of personnel employed or stationed at NAS Jacksonville is projected to decrease, and all associated households have been assumed to relocate away from the area. Relocation of households would likely result in a temporary loss of city of Jacksonville/Duval County tax revenues, where most of the personnel stationed or employed at NAS Jacksonville reside.

However, as indicated in Section 4.5.1, the loss in population would represent approximately 0.6% to 0.8% of the total population of Jacksonville. The historic and projected growth of the region suggests that any loss of tax revenues would be quickly recouped by other individuals moving to the area and replacing the population lost. In addition, the personnel change at NAS Jacksonville would include an increase in civilian and contractor personnel (who reside in the local community) and a larger decrease in military personnel (some of whom live on base). This would further reduce the overall potential loss in tax revenue impacts. This impact is assumed to be small and short-term.



#### **4.5.4 Education**

##### **4.5.4.1 Alternatives 1 through 6**

The projected decrease in personnel stationed or employed by NAS Jacksonville under each of the proposed alternatives would result in a corresponding decrease in school-aged children in the area because these families are assumed to relocate. The slight increase in civilian and contractor personnel (and their dependents) would be more than offset by the decrease in the military personnel (and their dependents), creating a net loss under all alternatives (see Table 4-17).

**Table 4-17 Projected Change in Number of School-Aged Children Resulting from P-8A MMA Personnel Transition at NAS Jacksonville**

	<b>Alternative 1</b>	<b>Alternatives 2, 3, and 5</b>	<b>Alternatives 4 and 6</b>
Military Personnel	(-)2,391	(-)2,549	(-)2,659
School-Aged Military Dependents	(-)1,000	(-)1,081	(-)1,137
Civilian and Contractor Personnel	569	520	321
School-Aged Non-Military Dependents	260	238	147
<b>Total School-Aged Children</b>	<b>(-)740</b>	<b>(-)843</b>	<b>(-)990</b>

The projected decrease in school-aged children in the area would have a minimal impact on enrollment within the Duval County school district. Given the size of the school district (serving 124,945 students as of the 2006-2007 school year), the projected loss of school-aged children under any of the alternatives would represent less than a 1% decrease in the total enrollment for the entire district<sup>1</sup>.

The enrollment losses from military school-aged dependents would be concentrated in schools with a history of high enrollment from NAS Jacksonville. The effect of the increase in civilian and contractor personnel would be spread further throughout the city of Jacksonville, assuming parents would like to live close to the base where they would be employed but could live in areas throughout the city or even outside city limits. The overall impact on specific schools is difficult to determine, although it is evident that the impact on the school district

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<sup>1</sup> The greatest change under any alternative is a decrease of 990 (Table 4-17, Alternatives 4 and 6) divided by 124,945 total enrollment, which equals (-) 0.8%.

would not be significant, and minor adjustments in the schools children attend could address potential capacity issues at individual schools.

The reduction in “federally connected students” attending district schools would result in a corresponding reduction in federal impact aid received by the district. However, this reduction in aid is not expected to have a significant fiscal impact because federal impact aid typically does not cover the full per-pupil costs received by the district.

#### **4.5.4.2 No Action Alternative**

Under the No Action Alternative, the P-8A MMA would not replace the P-3C and, thus, no change in personnel would take place. The number of base personnel would remain as it is now and there would be no associated change in the number of dependents of military or contractor/civilian personnel. There would be no impact on educational services as a result of the proposed action.

#### **4.5.5 Impacts on Minority and Low-Income Populations and Environmental Health and Safety Risks to Children**

Consistent with Executive Orders 12898 and 13045, and as discussed above in Section 3.5.5 in Section 3, Existing Environment: NAS Jacksonville, the Navy’s policy is to identify any disproportionately high and adverse human health or environmental effects of its actions on minority and low-income populations or that pose environmental health and safety risks to children. This analysis focuses on the potential for minority and low-income populations and children to be exposed to the projected aircraft noise associated with the various alternatives. The alternative selected for analysis is the one that would result in the largest number of individuals exposed to the greater-than-65 dB DNL noise contour which, at NAS Jacksonville, would be the airborne noise generated by the six fleet squadrons and FRS proposed under Alternative 1. Under this scenario, about 1,674 acres of on- and off-station land and water would be within the 65 dB DNL noise contour. Although the analysis examines only the potential effects associated with this alternative, the results of the analysis show that the potential effects of implementing any of the other alternatives would be similar to the effects of Alternative 1. Thus, the analysis represents the most conservative evaluation for potential environmental justice and environmental health and safety impacts.

Tables 4-18, 4-19, and 4-20 provide demographic and economic data for all census tracts that would have land areas that are wholly or partially within the greater-than-65 dB DNL noise contours under Alternative 1 (census tracts with noise contours only over water were not included). These demographic and economic data were compared with similar demographic and economic data for the communities of Jacksonville, Duval County, and the state of Florida (see Section 3.5.5) to determine whether the proposed action would have disproportionately high and adverse effects on minority and low-income populations or pose environmental health or safety risks to children. Where the minority and low-income populations or number of children within an identified affected area exceeds 50%, or the percentage of minority or low-income populations or children exceeds the comparable percentage of these populations in the community of comparison (i.e., the city or county), the population exposed is considered to receive a disproportionately high and adverse effect or to sustain environmental health or safety risks.

**Table 4-18 Total Persons by Race and Hispanic Origin for all 2000 Census Tracts within or Partially within the Greater-than-65 dB DNL Noise Zone at NAS Jacksonville under Alternative 1 (6 Fleet Squadrons and FRS)**

Census Tract <sup>a</sup>	Total Persons	Percent Hispanic	Percent Minority
013100	2,542	4.0%	15.0%
013300	5,413	4.9%	33.3%
013522	1,558	5.1%	25.9%
016500	5,225	3.8%	4.9%
<b>City of Jacksonville</b>	<b>735,617</b>	<b>4.1%</b>	<b>35.5%</b>
Duval County	778,879	4.1%	34.2%
State of Florida	15,982,378	16.8%	22.0%

Notes:

Shaded numbers represent those census tracts having a higher percentage of minority or Hispanic population than the community of comparison (city of Jacksonville). Duval County and the state of Florida are also included for reference but are not considered the "community of comparison."

<sup>a</sup> Does not include the NAS Jacksonville census tract 00132.00.

**Table 4-19 Percent of Population Considered Low Income in Each 2000 Census Tract Within or Partially Within the Greater- than-65 dB DNL Noise Zone at NAS Jacksonville under Alternative 1 (6 Fleet Squadrons and FRS)**

Census Tract <sup>a</sup>	Total Population	Percent Considered Low-Income (Below Poverty)
013100	2,542	8.4%
013300	5,413	10.2%
013522	1,558	7.9%
016500	5,225	3.7%

**Table 4-19 Percent of Population Considered Low Income in Each 2000 Census Tract Within or Partially Within the Greater-than-65 dB DNL Noise Zone at NAS Jacksonville under Alternative 1 (6 Fleet Squadrons and FRS) (continued)**

<b>Census Tract<sup>a</sup></b>	<b>Total Population</b>	<b>Percent Considered Low-Income (Below Poverty)</b>
<b>City of Jacksonville</b>	<b>735,617</b>	<b>12.2%</b>
Duval County	778,879	11.9%
State of Florida	15,982,378	12.5%

Source: U.S. Census Bureau 2000.

## Notes:

Shaded numbers indicate census tracts with a higher percentage of low-income households than the community of comparison (city of Jacksonville). Duval County and the state of Florida are also included for reference but are not considered the “community of comparison.”

<sup>a</sup> Does not include NAS Jacksonville census tract (00132.00).

**Table 4-20 Percent of Population Considered Children in Each 2000 Census Tract Within or Partially Within the Greater-than-65 dB DNL Noise Zone at NAS Jacksonville under Alternative 1 (6 Fleet Squadrons and FRS)**

<b>Census Tract<sup>a</sup></b>	<b>Population</b>	<b>Percent Considered Children (under 18 years of age)</b>
013100	2,542	25.1%
013300	5,413	28.3%
013522	1,558	26.3%
016500	5,225	21.3%
<b>City of Jacksonville</b>	<b>735,617</b>	<b>26.7%</b>
Duval County	778,879	26.3%
State of Florida	15,982,378	22.7%

Source: U.S. Census Bureau 2000.

## Notes:

Shaded numbers indicate census tracts with a higher percentage of youths than the community of comparison (city of Jacksonville). Duval County and the state of Florida are also included for reference but are not considered the “community of comparison.”

<sup>a</sup> Does not include NAS Jacksonville census tract (00132.00).

#### **4.5.5.1 Minority Populations**

Minority populations are defined by Executive Order 12898 as individuals who are Black/African-American (not of Hispanic origin), Asian or Pacific Islander, American Indian or Alaskan Native, or Hispanic. As shown in Table 4-18 (see also Section 3.5.5), in 2000 these minority populations in the city of Jacksonville, Duval County, and the state of Florida comprised 35.5%, 34.2%, and 22.0% of the populations, respectively. Figure 4-5 shows the locations of census tracts in the vicinity of NAS Jacksonville and their relationship to the modeled projected 2019 noise contours under Alternative 1.

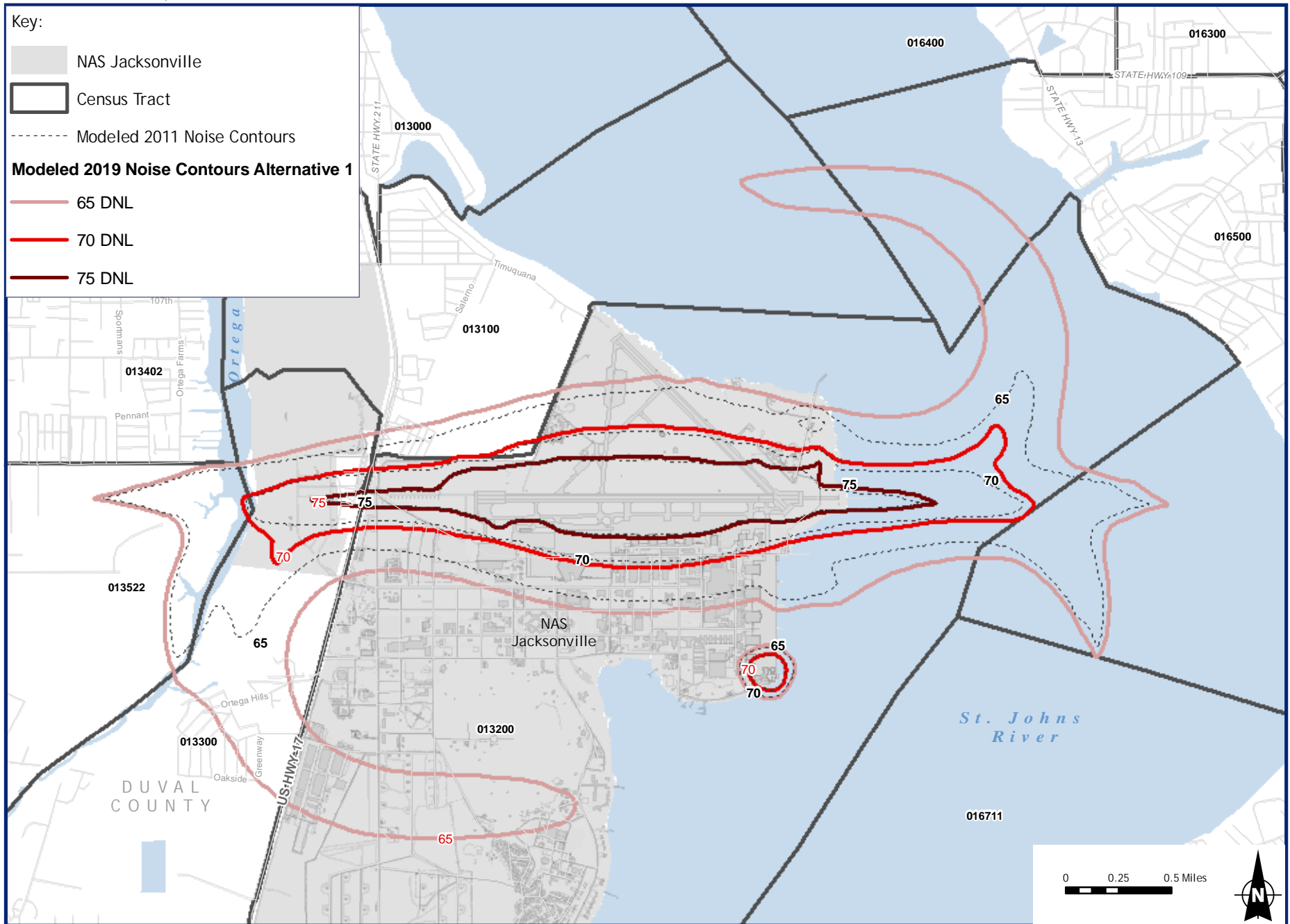


Figure 4-5  
 2000 Census Tracts Wholly or Partially within Modeled 2011 DNL Noise Contours  
 and 2019 DNL Noise Contours Projected Under Alternative 1 at NAS Jacksonville  
 Jacksonville, Florida

With the exception of Hispanic populations in two census tracts, the percentage of other minority population in all of these census tracts would be lower than the city average. Two census tracts (013300 and 013522) of concern do show a higher percentage of individuals of Hispanic origin than reside in the city of Jacksonville, the community of comparison. Further review shows that these census tracts are already partially within the greater-than-65 DNL noise contour under the baseline environmental conditions; however, a larger portion of each census tract would be within the greater than 65 DNL noise contour under Alternative 1. Thus, there is a potential for a disproportionately high and adverse environmental and human health impact on this minority (Hispanic) population.

Data at the census tract level (which are needed to understand the racial composition of a small area) are not available for any years more recent than the 2000 census. Estimating what the minority population in the census tracts would be in the 2011 baseline year and the proposed action year of 2019 requires looking at past trends. Data for the same census tracts from the 1990 census were examined. This basic trend analysis shows that the majority of the census tracts that would be affected by aircraft noise experienced a growth in minority population (from a percentage standpoint), nearly doubling in some instances. It is anticipated that this trend would continue into the years during which the proposed action would be implemented.

However, it should be noted that none of the affected census tracts would be wholly contained within the 65 dB DNL noise contour. As a result, the area of the census tract potentially impacted would include only a fraction of the total population. Moreover, the majority of the noise contours would either be contained within the NAS Jacksonville base boundary or over water.

#### **4.5.5.2 Low-Income Populations**

The Council on Environmental Quality (1997) defines low-income populations as populations considered by the U.S. Census Bureau to be “below poverty level” (U.S. Census Bureau 2000). The number of individuals below poverty level was obtained for each census tract that was wholly or partially within the greater-than-65 dB DNL noise contour under Alternative 1 at NAS Jacksonville. Table 4-19 presents the low-income statistics for the census tracts identified in Figure 4-5.

As shown in Table 4-19, no census tracts within the area encompassed by the greater-than-65 dB DNL contour have a higher rate of poverty than the city of Jacksonville (the community of comparison). For this reason, the proposed action would not have a disproportionately high or adverse environmental or human health effect on low-income populations.

#### **4.5.5.3 Children**

For the purposes of this analysis, children were defined as individuals under the age of 18 years. These statistics were obtained using 2000 U.S. Census data for each census tract that would be wholly or partially within the greater-than-65 dB DNL noise contour under Alternative 1. Figure 4-5 shows the impacted census tracts and Table 4-20 presents the statistics for each census tract.

According to this analysis, one census tract (013300) has a higher percentage of under-18 years-old individuals than the city of Jacksonville, the community of comparison. Thus, there is a potential for a disproportionate and adverse environmental health risk and safety effect on children. Further review showed that this census tract is already partially within the greater-than-65 dB DNL noise contour under the existing baseline environmental conditions; however, a larger portion of this census tract would be within the greater-than-65 dB DNL noise contour under Alternative 1. Thus, there is a potential for a disproportionately high and adverse environmental and human health impact on children. This census tract is not wholly contained within the 65 dB DNL noise contour. The amount of the census tract potentially impacted would be a fraction of the total population. The majority of the noise contours are contained within the NAS Jacksonville base boundary and over water.

## **4.6 Infrastructure and Utilities**

As noted in Section 3, infrastructure and utilities would not be affected by the proposed action and so are not discussed in this EIS.

## **4.7 Community Services**

As noted in Section 3, community services would not be affected by the proposed action and so are not discussed in this EIS.

## **4.8 Transportation**

As noted in Section 3, transportation would not be affected by the proposed action and so is not discussed in this EIS.

## **4.9 Topography and Soils**

Topography at NAS Jacksonville would not be affected by the proposed action because the proposed site for new construction is generally level and significant grading would not be required.

Soils at the proposed construction site would be temporarily disturbed by the proposed action. Impacts would include compaction and rutting from vehicle traffic and a potential for soil erosion during construction activities. The projected increase in impervious area under each alternative would increase the quantity and velocity of storm water runoff, which would increase the susceptibility of surrounding soils to erosion. These impacts would be minimized or avoided by using standard soil erosion- and sedimentation-control techniques at the construction site such as silt barriers (filter fabric) and appropriate revegetation techniques upon completion. Revegetation techniques would include replanting disturbed areas with native plants and specific seed mixtures as recommended by the Natural Resources Conservation Service (NRCS). Consequently, potential impacts on soils at NAS Jacksonville would be minor and temporary.

Under the No Action Alternative no additional facilities would be constructed to support the current operations of P-3C aircraft; therefore, topography and soils would not be affected.

## **4.10 Water Resources and Wetlands**

### **4.10.1 Surface Water**

No waterbodies are present within or immediately adjacent to the proposed construction area at NAS Jacksonville; therefore, the proposed action would have no direct effects on surface waterbodies.

### **4.10.2 Water Quality**

Construction of the facilities to support the P-8A MMA replacement at NAS Jacksonville would disturb approximately 3 acres under Alternatives 4 and 6 and 5 acres under Alternatives 1,



2, 3, and 5. Storm water runoff from the construction site could potentially affect water quality in the lower St. Johns River basin through the introduction of sediments, particulates, and various constituents. A construction National Pollutant Discharge Elimination System (NPDES) storm water permit would be obtained from the Florida Department of Environmental Protection through their storm water permitting program because more than 1 acre would be disturbed during construction under all replacement alternatives. Under the permit, the Navy would submit a site-specific Storm Water Pollution Prevention Plan (SWPPP) for new discharges that would include a site plan for managing storm water runoff and that describes the best management practices (BMPs) to be implemented to eliminate or reduce erosion, sedimentation, and storm water pollutants. Examples of storm water BMPs that may be used include:

- **Retention ponds.** Permanent structures designed to allow time for sediments to settle and water to infiltrate the ground;
- **Temporary sediment basins.** Structures designed to detain sediment-laden runoff from disturbed areas long enough for sediments to settle out and control the release of storm water;
- **Silt fencing.** A temporary erosion and sediment control used to prevent dirt from entering waterways before bare soil is stabilized with vegetation; and
- **Berms.** A temporary erosion and sediment control that physically prevents polluted runoff from entering nearby storm drain inlets and waters.

With proper implementation of the SWPPP, impacts on water quality from erosion and off-site sedimentation would be negligible.

The new construction to support the P-8A MMA would create approximately 2.1 acres of new impervious surface under Alternatives 4 and 6 and 3.8 acres under Alternatives 1, 2, 3, and 5. This surface would, on the average, generate an additional 2.28 million gallons of runoff per year under Alternatives 4 and 6 and 4.13 million gallons of runoff per year under Alternatives 1, 2, 3, and 5. Once the facilities are constructed, storm water from the new impervious surface would be directed to a new storm water conveyance system or the existing storm water conveyance system via sheet flow or grass-lined swales for discharge to the lower St. Johns River.

Under the No Action Alternative no additional facilities would be constructed to support the current operations of P-3C aircraft; therefore, water quality would not be affected.

#### **4.10.3 Floodplains**

The proposed action would have no impact on the base flood elevation of the lower St. Johns River at NAS Jacksonville under any of the replacement alternatives because the mapped 100-year floodplain does not extend within or adjacent to the proposed construction area.

Under the No Action Alternative no additional facilities would be constructed to support the current operations of P-3C aircraft; therefore, the 100-year floodplain would not be affected.

#### **4.10.4 Groundwater**

The proposed action would not impact groundwater resources in the vicinity of NAS Jacksonville. None of the proposed construction at the station would extend below surface at a depth that would impact the underlying water table. Although fuel or other chemicals could be spilled during construction, immediate cleanup of these spills would prevent any infiltration into the underlying groundwater. Since the number of personnel employed or stationed at NAS Jacksonville would decrease slightly under each of the replacement alternatives, there would be a corresponding slight decrease in the demand for groundwater from the regional aquifer system.

Under the No Action Alternative no additional facilities would be constructed to support the current operations of P-3C aircraft; therefore, groundwater resources would not be affected.

#### **4.10.5 Wetlands**

The proposed action would have no impact on wetlands at NAS Jacksonville under any of the replacement alternatives because no wetlands are located on or adjacent to the proposed construction area.

Under the No Action Alternative no additional facilities would be constructed to support the current operations of P-3C aircraft; therefore, wetlands would not be affected.

### **4.11 Biological Resources**

#### **4.11.1 Vegetation**

Construction of the training facilities and POV parking area under all replacement alternatives would have a minor effect on vegetation. Approximately 4 acres of maintained lawn would be removed under Alternatives 1, 2, 3, and 5, while Alternatives 4 and 6 would remove approximately 2 acres of this vegetative cover. A small portion (< 1 acre) of an isolated upland

pine stand could also potentially be removed to accommodate the new facilities under Alternatives 1, 2, 3, and 5. The vegetation permanently removed for the proposed action would total less than 1% of the currently vegetated area at the station. Furthermore, no unique or natural vegetation communities would be affected by the proposed action at NAS Jacksonville.

Under the No Action Alternative no additional facilities would be constructed to support the current operations of P-3C aircraft; therefore, vegetation would not be affected.

#### **4.11.2 Wildlife**

The proposed construction area at NAS Jacksonville does not provide suitable habitat to support a diverse or abundant terrestrial wildlife population because of the lack of vegetation cover and habitat diversity. Therefore, the relatively minor construction projects at the station under all replacement alternatives would have a negligible effect on terrestrial wildlife.

Implementing the measures outlined in Section 4.10 to control storm water runoff from construction sites and new impervious surfaces would prevent the degradation of water quality in the surface waters surrounding the station. Therefore, the proposed action would have no effect on aquatic habitats adjacent to NAS Jacksonville.

The following operational changes associated with each of the replacement alternatives at NAS Jacksonville were considered in evaluating the potential for adverse effects on wildlife:

- There would be a decrease in the annual number of flight operations as per the P-8A MMA flight syllabus.
- There would be no significant change in the type, location, or current ratio of daytime and nighttime operations as per the P-8A MMA flight syllabus.
- Although the P-8A MMA is approximately 1 dB louder than the P-3C during takeoff, the P-8A MMA climbs faster on departure than does the P-3C, resulting in a comparable noise impact on the ground.
- The P-8A MMA is approximately 2 dB louder than the P-3C during landing, causing a slightly higher, yet still comparable, noise impact on the ground.

These operational changes associated with the proposed action would have no adverse effects on wildlife. Studies focused on investigating the impacts of aircraft noise on wildlife and domestic animal species have involved observations of a variety of species, including waterfowl, shore birds, song birds, terrestrial mammals, marine mammals, and domestic animals (cows, chickens, sheep, and horses). Overall, the literature suggests that species differ in their response

to aircraft noise (Manci et al. 1988). All species (those previously not exposed to aircraft noise), however, seem to initially respond with some form of a startle response, the intensity and duration of which diminishes or disappears with subsequent exposures. Other general responses include running, stampeding, flying, circling, or becoming motionless. Several studies indicate there is a strong tendency for species to acclimate or habituate to noise disturbances (Grubb and King 1991; Ellis et al. 1991; Manci et al. 1988; Fraser et al. 1985; Fleming et al. 1996; Black et al. 1984). Given the nature of current NAS Jacksonville operations, locally occurring wildlife species have likely become habituated to aircraft noise. Additionally, the predicted minor increase in noise levels is not anticipated to cause adverse or disruptive impacts on local wildlife populations.

Under the No Action Alternative no additional facilities would be constructed to support the current operations of P-3C aircraft and current aviation activities at the station would continue unchanged; therefore, wildlife would not be affected.

#### **4.11.2.1 Migratory Birds**

As mentioned in Section 3, Existing Environment: NAS Jacksonville, Section 3.11, routine operation and maintenance of P-8A MMA at the airfield and proposed construction of support infrastructure would not be exempt from the take prohibitions of the Migratory Bird Treaty Act (MBTA) (see Rule 72 Federal Register [FR] 56926). As noted above in the discussion of wildlife impacts, the predicted minor increase in noise levels is not anticipated to cause adverse or disruptive impacts on local wildlife populations, including migratory bird species. Furthermore, the proposed new construction would not directly affect any species of migratory birds or remove habitat that is important to migratory bird populations (see also Section 4.11.1). The NAS Jacksonville Bird-Airstrike Hazard (BASH) Plan and INRMP also provide project and operations guidance to aid in MBTA compliance.

#### **4.11.2.2 Bird-Aircraft Strike Hazards**

No aspect of the replacement alternatives or the No Action Alternative would create attractants with the potential to increase the concentration of birds in the vicinity of the airfield. Therefore, considering the decrease in annual operations and use of existing flight tracks, no increase in BASH risk would occur at NAS Jacksonville.

### **4.11.3 Threatened and Endangered Species**

#### **4.11.3.1 Manatee**

As discussed in Section 3.11.3, manatees are commonly present along the station's shoreline in the lower St. Johns River. The proper implementation of measures outlined in Section 4.10 to control storm water runoff from construction sites and new impervious surfaces would prevent the degradation of water quality in the surface waters surrounding the station. Therefore, the proposed action would have no effect on aquatic habitats adjacent to NAS Jacksonville that are known to support the manatee.

Previous studies indicate the increase in noise levels over water under each replacement alternative would not affect the manatee. Manatees appear relatively unresponsive to human-generated noise to the point that they are often suspected of being deaf to oncoming boats (although their hearing is actually similar to that of pinnipeds [Bullock et al. 1980]). Manatees continue to occupy canals near Miami International Airport, which suggests that they have become habituated to human disturbance and noise (Metro Dade County 1995). Since manatees spend most of their time below the surface and do not startle readily, no effect of aircraft overflights on manatees would be expected (Bowles et al. 1991).

After considering these studies, the Navy determined that the proposed action would have no effect on the endangered manatee.

#### **4.11.3.2 Wood Stork**

As Section 3, Existing Environment: NAS Jacksonville, Section 3.11.3 notes, wood storks are commonly observed foraging along the shores of Lake Scotalis on the station. The proposed construction area at the station would be located approximately 4,000 feet north of the lake. Construction would not cause ground disturbance of the wood stork's habitat. The construction areas would be more than 0.5 miles from their habitat; therefore, no indirect noise effects are expected from construction activities. This distance is considered a suitable buffer such that wood storks foraging on the station would not be disturbed by construction activities.

Given the nature of current NAS Jacksonville operations, wood storks using the station have likely become habituated to aircraft noise. While noise levels are projected to generally increase at NAS Jacksonville, high noise levels (e.g., within the greater-than-75 dB noise con-

tours) would not encroach on areas where wood storks are known to forage. Furthermore, other aircraft operating at the station, such as the F/A-18E/F, would continue to generate louder single-event noise emissions compared with the P-8A MMA and would be more likely to disturb foraging wildlife. Consequently, P-8A MMA operations at NAS Jacksonville are not anticipated to disrupt wood stork foraging behavior on the station. Thus, the Navy has determined that the proposed action would have no effect on the endangered wood stork.

#### **4.11.3.3 Eastern Indigo Snake**

There have been no recorded occurrences of the eastern indigo snake at NAS Jacksonville. As noted in Section 3, Existing Environment: NAS Jacksonville, Section 3.11.3, eastern indigo snakes are closely associated with the gopher tortoise and use gopher tortoise burrows as dens and for egg-laying. The potential occurrence of the eastern indigo snake would be limited to suitable habitat areas in the southern portion of the station, where gopher tortoise burrows are known to exist. These suitable habitat areas are located more than 0.5 miles from the proposed construction site. Thus, the proposed construction would cause no direct or indirect disturbance of the eastern indigo snake's habitat. Consequently, the Navy has determined that the proposed action would have no effect on the eastern indigo snake.

#### **4.11.3.4 Shortnose Sturgeon**

As discussed in Section 3.11.3, recent intensive sampling efforts did not identify any shortnose sturgeon in the lower St. Johns River near NAS Jacksonville. In addition, water quality in the lower St. Johns River would not be affected by the proposed action. Consequently, the Navy has determined that the proposed action would have no effect on the shortnose sturgeon.

#### **4.11.3.5 Other Species of Concern**

Other species of concern on or in the immediate vicinity of NAS Jacksonville include the bald eagle, Sherman's fox squirrel, least tern, snowy egret, little blue heron, tricolored heron, gopher tortoise, and southern red lily. Given the historical occurrence of bald eagles in the vicinity of NAS Jacksonville, there is the potential for bald or golden eagles to be in the general vicinity of the proposed action. However, none of these species are likely to be present within or adjacent to the proposed construction area because of the absence of preferred foraging or nesting habitat. A take permit as authorized under the Bald and Golden Eagle Protection Act (16 U.S.C.

§§ 668-668d, June 8, 1940, as amended 1959, 1962, 1972, and 1978) is not applicable. The increase in aircraft noise levels under each replacement alternative would not adversely affect any of these species. Consequently, implementation of the proposed action would have no effect on any other species of concern at NAS Jacksonville.

#### **4.11.4 Marine Mammals**

The manatee is protected under the Marine Mammals Protection Act (MMPA), as previously discussed, and would not be affected by construction activities or aircraft operations at NAS Jacksonville under any of the replacement alternatives. Consequently, the Navy has determined that the proposed action would not result in reasonably foreseeable “takes” of a marine mammal species by harassment or injury or mortality as defined under the MMPA.

### **4.12 Cultural Resources**

#### **4.12.1 Architectural Resources**

Effects on historic resources included in the National Register of Historic Places (NRHP) or those eligible for listing in the NRHP were evaluated with regard to the *Criteria of Effect and Adverse Effect*, established by the Advisory Council for Historic Preservation (ACHP) (36 Code of Federal Regulations [CFR] 800.9). These criteria are listed in Table 4-21.

**Table 4-21 Criteria for Adverse Effects on Historic Properties**

<b>Criteria for Adverse Effects</b>
“An adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property’s location, setting, materials, workmanship, feeling, or association. Consideration shall be given to all qualifying characteristics of a historic property, including those that may have been identified subsequent to the original evaluation of the property’s eligibility for the National Register. Adverse effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance or be cumulative” (36 CFR 800.5[a][1]).
<b>Examples of Adverse Effects</b>
“Adverse effects on historic properties include, but are not limited to:
<ol style="list-style-type: none"><li>1. Physical destruction of or damage to all or part of the property;</li><li>2. Alteration of a property, including restoration, rehabilitation, repair, maintenance, stabilization, hazardous material remediation and provision of handicapped access, that is not consistent with the Secretary’s Standards for the Treatment of Historic Properties (36 CFR Part 68) and applicable guidelines;</li></ol>

**Table 4-21 Criteria for Adverse Effects on Historic Properties (continued)**

- |  |
|--|
| <ol style="list-style-type: none"><li>3. Removal of the property from its historic location;</li><li>4. Change of the character of the property's use or of physical features within the property's setting that contribute to its historic significance;</li><li>5. Introduction of visual, atmospheric or audible elements that diminish the integrity of the property's significant historic features;</li><li>6. Neglect of a property which causes its deterioration, except where such neglect and deterioration are recognized qualities of a property of religious and cultural significance to an Indian tribe or Native Hawaiian organization;</li><li>7. Transfer, lease, or sale of property out of Federal ownership or control without adequate and legally enforceable restrictions or conditions to ensure long-term preservation of the property's historic significance" (36 CFR 800.5[a][2]).</li></ol> |
|--|

As noted in Section 3.12, seven buildings at NAS Jacksonville built before 1960 have been determined to be eligible for listing on the NRHP. NAS Jacksonville also includes five historic districts. None of the NRHP-eligible buildings or structures within the historic districts would be physically altered as a result of the proposed construction activities under any of the replacement alternatives. Furthermore, the new construction would be located at a sufficient distance to the west and north of the NRHP-eligible buildings and historic districts such that these resources would not incur any adverse viewshed effects.

With respect to the potential for aircraft noise effects on the structural components of historical buildings, Sutherland (1989) studied the effects of low-altitude, high-speed aircraft on structures. This study showed there is little probability of structural damage occurring as a result of such operations. In addition, there are no historical data in the *Integrated Cultural Resources Management Plan for the Jacksonville Naval Air Station* that document damage to historic structures caused by noise vibrations from aircraft operations. As indicated by the Sutherland (1989) study and past experience, there would be no vibration-related effects on historic properties at the station as a result of the slight increase in noise exposure.

Therefore, in accordance with the Advisory Council's regulations concerning the criteria for adverse effects, the Navy has concluded that the proposed action would have no effect on historic resources. These findings were communicated to the Florida Department of State, Division of Cultural Resources, consistent with the NHPA Section 106 process (Winter 2007). The Flor-



ida State Historic Preservation Office (SHPO) concurred with the Navy's findings in a letter dated April 21, 2008 (see Appendix E).

#### **4.12.2 Archaeological Resources**

The results of a previous Phase 1 archaeological survey show that no archaeological resources are present within the proposed construction area at NAS Jacksonville. Therefore, the Navy has concluded that the proposed action would have no effect on archaeological resources. These findings were communicated to the Florida Department of State, Division of Cultural Resources, consistent with the NHPA Section 106 process (Winter 2007). The Florida SHPO concurred with the Navy's findings in a letter dated April 21, 2008 (see Appendix E).

#### **4.13 Environmental Management**

##### **4.13.1 Hazardous Materials and Waste Management**

Operation and maintenance of the P-8A MMA under all alternatives associated with this action would not introduce any additional hazardous materials and/or waste streams that cannot be managed by existing hazardous materials and waste management functions and facilities at NAS Jacksonville.

NAS Jacksonville has handled hazardous materials and hazardous waste associated with operation and maintenance of the P-3C aircraft since 1979. A review of a hazardous waste generation report for calendar year (CY) 2006 at NAS Jacksonville indicates that the types of chemicals and waste materials associated with operation and maintenance of the P-8A MMA are not substantially different from the types of chemicals and waste materials NAS Jacksonville is currently managing under its hazardous materials and hazardous waste management programs. NAS Jacksonville is currently managing hazardous materials and waste associated with operation and maintenance of the P-3C aircraft, and any facilities or functions needed to handle P-8A MMA equipment and its associated materials and waste streams are already in place.

Modifying interiors of existing facilities to support the MMA aircraft, including minor changes to room configuration, electrical power routing, heating, ventilation, and air conditioning (HVAC), mountings for replacement equipment, etc., would have no impact on the hazardous materials usage or hazardous waste generation at NAS Jacksonville. These modifications

would be completed with minimal quantities, if any, of potentially hazardous materials (e.g., paint, solvents). The vehicle repair and maintenance activities at NAS Jacksonville are not projected to change with transitioning from P-3C aircraft to P-8A MMA squadrons. The avionic systems, engines, and aircraft components on the P-8A MMA would require using cleaners, coolants, paints, or other hazardous materials similar to those used to service the existing aircraft fleet. All wastes would continue to be collected, managed, and stored on-site in accordance with NAS Jacksonville's Resource Conservation and Recovery Act (RCRA) Part B operating permit.

#### **4.13.2 Installation Restoration Program (IRP) Sites**

The proposed action would have no impact on on-going remedial activities at NAS Jacksonville, and none of the proposed renovation and modification activities under any siting alternative would result in potential hazardous exposures to on-site personnel. No proposed projects would require large-scale removal or disturbance of surface soil, subsurface soil, groundwater, or existing groundcover near or within any IRP site. Therefore, contaminated media would not likely be encountered near IRP site locations.

## **5 Existing Environment: NAS Whidbey Island**

### **Introduction**

NAS Whidbey Island encompasses five land units, four of which are located in Island County, Washington (Ault Field, outlying landing field [OLF] Coupeville, Seaplane Base, and Lake Hancock), and one that is located in northern Oregon (Naval Weapons Systems Training Facility [NWSTF] Boardman). The four land units located in Island County are approximately 50 miles north of Seattle, Washington, in Puget Sound.

Ault Field is the primary operational facility for NAS Whidbey Island and the location of the central airfield. All facilities necessary to support the P-8A MMA at NAS Whidbey Island would be located at Ault Field. All P-8A MMA operations at NAS Whidbey Island would originate from and return to Ault Field. Consequently, existing environmental resources discussed in this section relate primarily to Ault Field and the surrounding area.

The existing environment for each relevant environmental resource is described herein to provide the public and agency decision makers with a meaningful point from which to compare potential future environmental, social, and economic effects of the proposed action and alternative actions. The environmental impacts on each resource are discussed in Chapter 6, Environmental Consequences: NAS Whidbey Island, and include a consideration of the direct and indirect effects of the proposed action (see Chapter 2, Proposed Action and Alternatives), including the No Action Alternative. Cumulative effects are described in Chapter 11.

The Council on Environmental Quality (CEQ) regulations implementing the National Environmental Policy Act (NEPA) of 1969 require that an EIS “succinctly describe the environment of the area to be affected or created by the alternatives under consideration” (40 Code of Federal Regulations [CFR] 1502.15). The descriptions of the existing environmental resources that could be affected by implementation of the proposed action and its alternatives need be no longer than necessary. Consistent with this guidance, Navy policy directs that the EIS should exclude material not directly applicable to the expected impact. Therefore, the discussion of the existing environment focuses on those resource areas where there is a potential for significant impact.

Under the siting alternatives for NAS Whidbey Island, the existing environment may be affected by the following components of the proposed action:

- Aircraft operations;
- New construction and renovation; and
- Personnel relocation and transition.

Accordingly, the discussion of the existing environment in the vicinity of NAS Whidbey Island focuses on airfield operations, noise, land use, air quality, socioeconomics, topography and soils, biological resources, and environmental management practices. In contrast, because the change in the number of personnel stationed or employed at NAS Whidbey Island would be negligible under all alternatives, the following existing environmental resources are not addressed in detail in this EIS because implementation of the proposed action and its alternatives would have a negligible effect or no effect on them:

- **Infrastructure and Utilities.** Under all alternatives the number of personnel stationed or employed at Ault Field would change slightly, with a corresponding negligible change in water use, wastewater discharge, power use, and solid waste generation.
- **Community Services.** Changes to the existing community services, including fire protection, emergency, security, and medical services are not anticipated under any of the homebasing alternatives for NAS Whidbey Island or the surrounding communities. All of the siting alternatives project a slight change in personnel stationed or employed at NAS Whidbey Island, and any potential impact associated with the change in the use of on-station or residential community services would be negligible.
- **Transportation.** Under all alternatives the number of personnel stationed or employed at NAS Ault Field would change slightly, with a corresponding negligible change in personally owned vehicles, traffic, and the miles traveled. Thus, no additional congestion, traffic, or transportation requirements are anticipated on or around the base.

## **5.1 Airfield Operations**

Aircraft activities at Ault Field include both fixed- and rotary-wing operations. The air station provides land-based support and training for all of the Navy's active duty EA-6B aircraft squadrons (being replaced by EA-18G by 2013) and the Pacific Fleet P-3C and EP-3<sup>1</sup> patrol and reconnaissance aircraft squadrons. The air station serves as host to two air wings (Electronic At-

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<sup>1</sup> The EP-3 aircraft are not part of the P-8A MMA replacement action.

tack Wing Pacific and Patrol and Reconnaissance Wing Ten), a Fleet Logistics Support squadron, and NAS Whidbey Island Search and Rescue. The EA-6B and P-3C aircraft platforms are the predominant aircraft flown at NAS Whidbey Island and are operated by Electronic Attack Wing Pacific and Patrol and Reconnaissance Wing Ten, respectively. The station also supports a Navy Reserve P-3C and C-9 squadron in addition to the air station's MH-60S search-and-rescue helicopters.

The airfield at Ault Field consists of two intersecting runways, Runway 07/25 and Runway 14/32. Both runways are 8,000 feet long and 200 feet wide. Ault Field is open seven days per week, 24 hours per day. Runways 25 and 14 are the most frequently used runways at the station. Approximately 44% of the airfield operations are assigned to Runway 25, and 36% of the airfield operations are assigned to Runway 14. Runways 07 and 32 are used less frequently; 13% of the airfield operations are assigned to Runway 07, and 7% are assigned to Runway 32.

Under the National Airspace System, the airspace above Ault Field is designated as Class C airspace. Vertical limits are separated by two layers—an upper layer with a 10-nautical mile (NM) radius over a bottom layer with a 5-NM radius. The floor of the upper layer is 1,200 feet above mean sea level (amsl) with a ceiling of 4,000 feet amsl. The bottom layer extends from the surface to 1,200 feet amsl. The NAS Whidbey Island Radar Air Traffic Control Facility is responsible for the safe, orderly, and expeditious flow of air traffic operating within the Whidbey approach control's 2,100 square miles of airspace.

Pilots perform approximately 78,000 flight operations (i.e., any takeoff or landing) annually at Ault Field (Wyle Laboratories, Inc. October 2004; Duquette April 25, 2008). This number is based on projected 2013 operations at Ault Field under representative conditions that are projected to occur once the Navy fully transitions from the EA-6B to the EA-18G aircraft but before the P-8A MMA are based at NAS Whidbey. (The Navy had previously modeled projected 2013 noise zones for NAS Whidbey Island which, for this analysis, provide previously verified best available data and represent the source for baseline conditions for NAS Whidbey Island for this EIS analysis). As shown on Table 5-1, under baseline conditions airfield operations at Ault Field would be predominantly EA-18G and P-3C operations, which would account for 51% and 47%, respectively, of the total airfield operations (Naval Facilities Engineering

Command Southwest May 2005). Less than 10% (7,294 operations) of the total annual operations occur at night.

**Table 5-1 Projected Annual Operations at Ault Field (2013)**

	<b>Day (7:00 a.m. to 11:00 p.m.)</b>	<b>Night (11:00 p.m. to 7:00 a.m.)</b>	<b>Total</b>
<b>EA-18G</b>			
Departure	4,255	333	4,588
Arrival	4,235	353	4,588
Touch-and-Go	8,727	412	9,139
FCLP	15,122	3,160	18,282
Depart and Re-enter	226	17	243
GCA Pattern	1,936	1,745	3,681
<b>Total</b>	<b>34,501</b>	<b>6,020</b>	<b>40,521</b>
<b>P-3C</b>			
Departure	1552	47	1,599
Arrival	1552	47	1,599
Touch-and-Go	18,840	200	19,040
FCLP	0	0	0
Depart and Re-enter	0	0	0
GCA Pattern	3,768	0	3,768
<b>Total</b>	<b>25,712</b>	<b>294</b>	<b>26,006</b>
<b>EP-3<sup>1</sup></b>			
Departure	621	19	640
Arrival	621	19	640
Touch-and-Go	7,536	0	7,536
FCLP	0	0	0
Depart and Re-enter	0	0	0
GCA Pattern	1507	0	1,507
<b>Total</b>	<b>10,285</b>	<b>38</b>	<b>10,323</b>
<b>C-9</b>			
Departure	211	114	325
Arrival	211	114	325
Touch-and-Go	0	0	0
FCLP	0	0	0
Depart and Re-enter	0	0	0
GCA Pattern	0	0	0
<b>Total</b>	<b>422</b>	<b>228</b>	<b>650</b>
<b>Transient Aircraft</b>			
Departure	164	88	252
Arrival	164	88	252
Touch-and-Go	0	0	0

**Table 5-1 Projected Annual Operations at Ault Field (2013) (continued)**

	<b>Day (7:00 a.m. to 11:00 p.m.)</b>	<b>Night (11:00 p.m. to 7:00 a.m.)</b>	<b>Total</b>
FCLP	0	0	0
Depart and Re-enter	0	0	0
GCA Pattern	0	0	0
<b>Total</b>	<b>328</b>	<b>176</b>	<b>504</b>
<b>Summary – AIRFIELD TOTAL</b>			
Departure	6,803	601	7,404
Arrival	6,783	621	7,404
Touch-and-Go	35,103	612	35,715
FCLP	15,122	3,160	18,282
Depart and Re-enter	226	17	243
GCA Pattern	7,211	1,745	8,956
<b>Total</b>	<b>71,248</b>	<b>6,756</b>	<b>78,004</b>

Note:

<sup>1</sup> The EP-3 aircraft are not part of the P-8A MMA replacement action.

Key:

FCLP = Field carrier landing practice.

GCA = Ground control approach.

Aircraft flying patterns approaching or departing from Ault Field normally fly specific routes, i.e., flight tracks. Flight tracks are represented as single lines on maps and other graphics and depict the average route of the aircraft over the ground. These tracks are affected by aircraft performance, pilot technique, other air traffic, and weather conditions such that the actual flight path (track) is a band rather than a single line as depicted on maps. Arrival and departure flight tracks associated with Ault Field are depicted in Figures 5-1a and 5-1b.

## 5.2 Noise

Aircraft operations, including flight operations and ground engine-maintenance run-ups, are the primary source of noise at NAS Whidbey Island. Flight operations at NAS Whidbey Island are dominated by the EA-18G and the P-3C (see Table 5-1). However, the EA-18G contributes approximately 98% of the acoustic energy to the noise environment at NAS Whidbey Island (see Figure 5-2) (Wyle Laboratories, Inc. July 2008). Other flight operations include the C-9 and transient aircraft.

In-frame and out-of-frame engine maintenance run-ups are used to test the engine at various power settings and durations. In-frame engine maintenance run-ups designated for low- or

high-power testing are conducted at several locations at NAS Whidbey Island. Out-of-frame engine testing is conducted at an engine test cell in Building 2525 and next to Building 2765 (Navy Facilities Engineering Command Southwest May 2005). Pre-flight engine run-ups are generally not conducted for the types of aircraft stationed at NAS Whidbey Island.

Noise exposure is typically calculated using the day-night average sound level (DNL). The DNL noise metric is based on the number of operations that occur on an average annual day or average busy day over a 24-hour period. The DNL metric includes a 10 decibel (dB) penalty for nighttime operations (10:00 p.m. to 7:00 a.m.) because people are more sensitive to noise during normal sleeping hours, when ambient noise levels are lower. The DNL has been determined to be a reliable measure of community annoyance with aircraft noise and has become the standard metric used by many federal and state governmental agencies and organizations in the United States, such as the U.S. Environmental Protection Agency (EPA) and the Federal Aviation Administration (FAA), for assessing aircraft noise.

The DNL for the community is depicted as a series of contours that connect points of equal value, usually in 5-dB increments. Calculated noise contours do not represent exact scientific measurements. The area between two specific contours is known as a noise zone. The noise zones used in this study are:

- Less than 65 dB DNL;
- 65 to <70 dB DNL;
- 70 to <75 dB DNL; and
- Greater than 75 dB DNL.

Individual response to noise levels varies and is influenced by many factors, including:

- The activity the individual is engaged in at the time of the noise;
- General sensitivity to noise;
- Time of day;
- Length of time an individual is exposed to a noise;
- Predictability of noise; and
- Average temperature.

A small change in dBA (A-weighted decibels) would not generally be noticeable. As the change in dBA increases, individual perception is greater, as shown in Table 5-2.



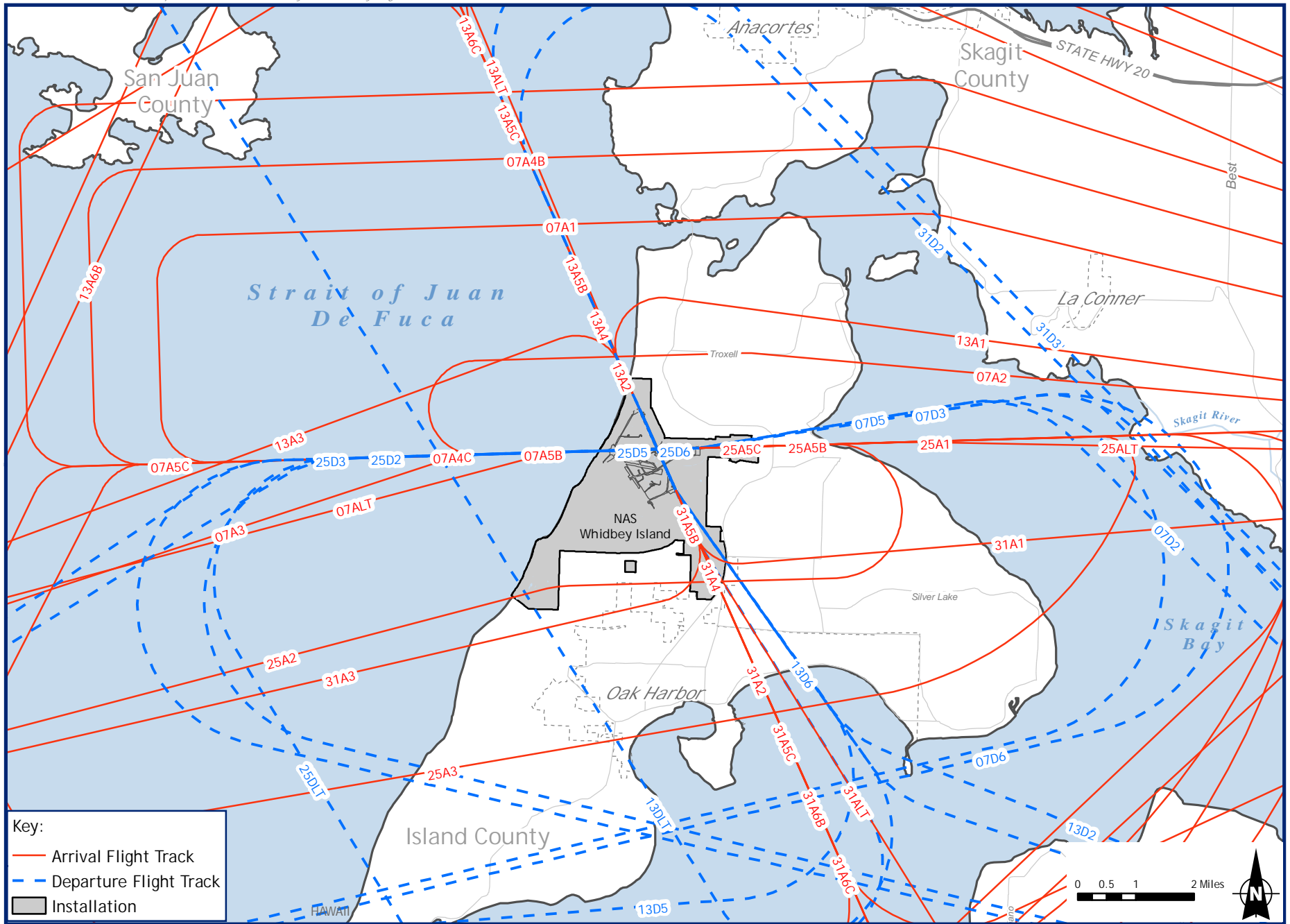


Figure 5-1a  
 P-3C Arrival and Departure Flight Tracks  
 NAS Whidbey Island, Washington

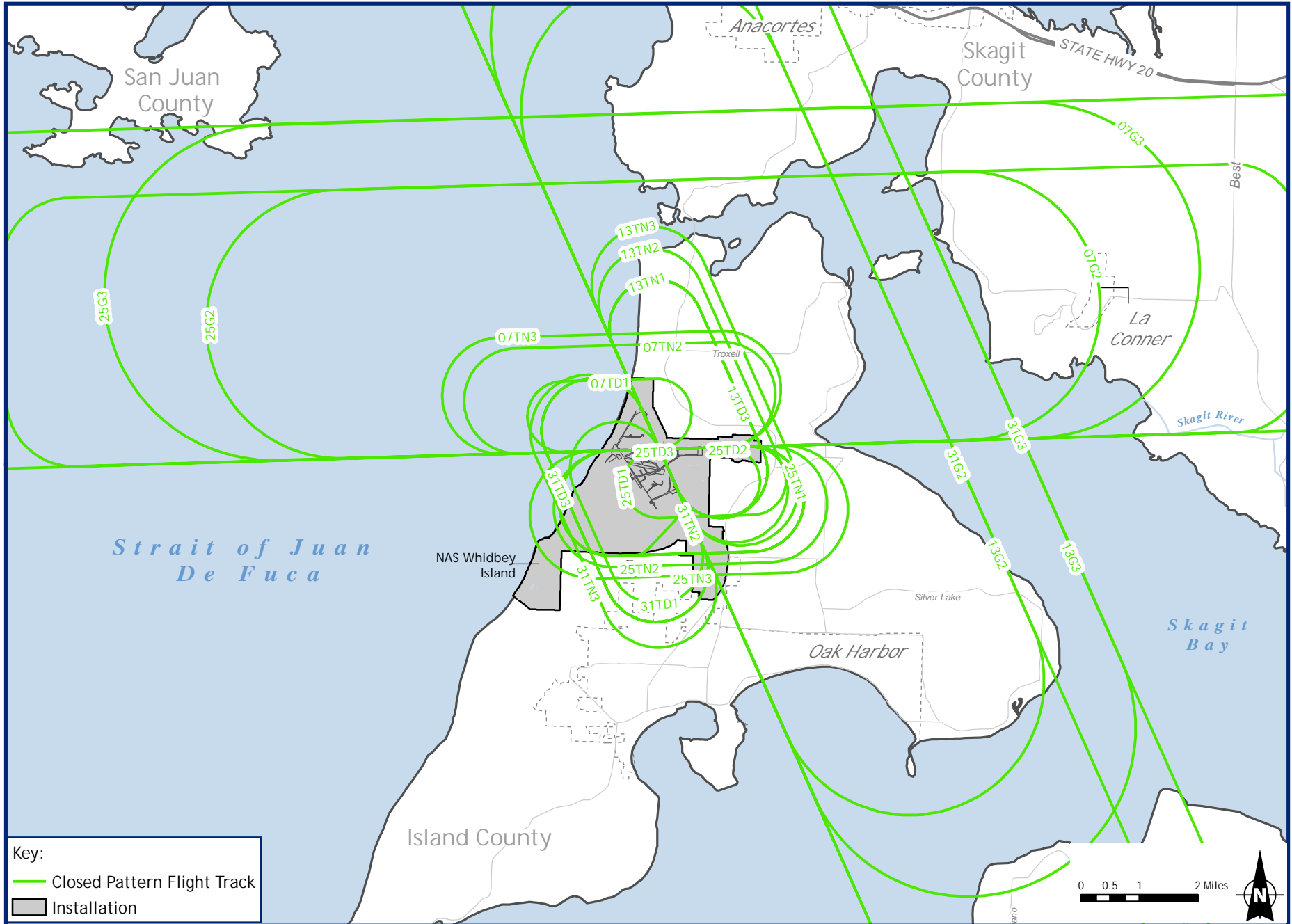
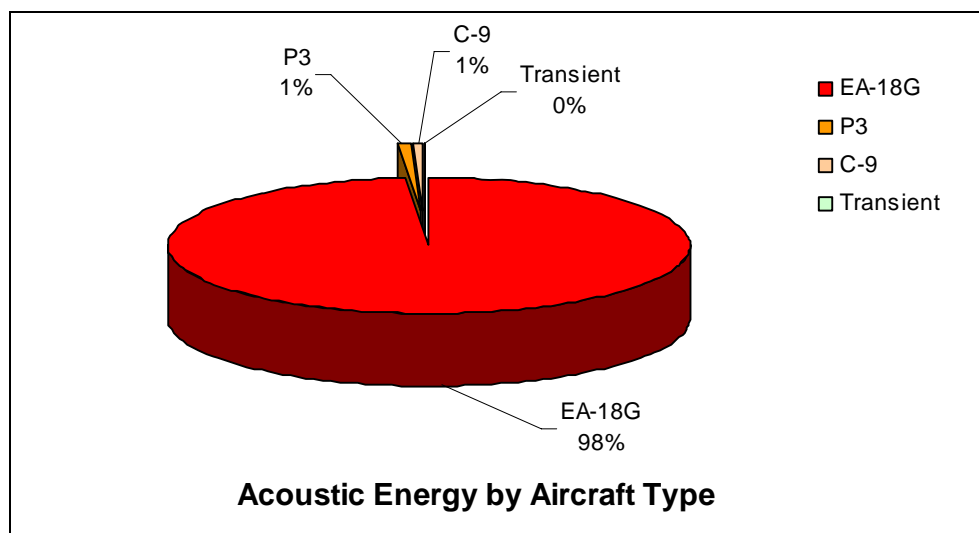


Figure 5-1b  
P-3C Closed Pattern Flight Tracks  
NAS Whidbey Island, Washington



**Figure 5-2 Acoustic Energy by Aircraft Type at NAS Whidbey Island**

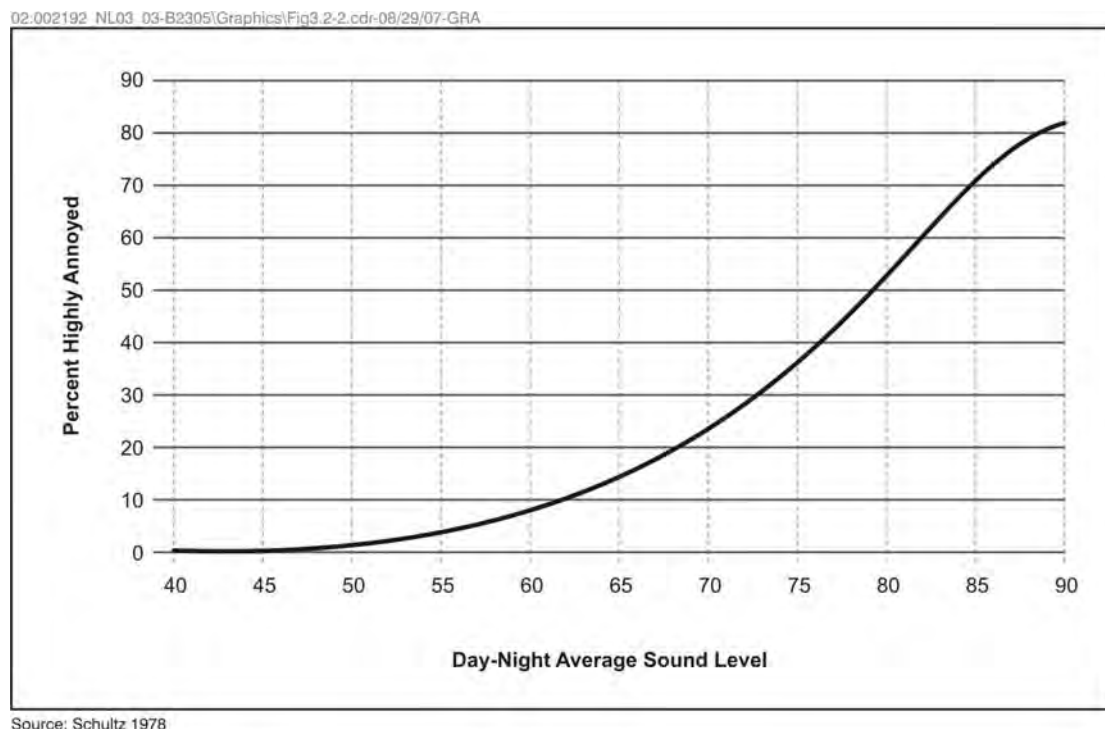
**Table 5-2 Subjective Responses to Changes in A-Weighted Decibels**

Change	Change in Perceived Loudness
1 dB	Requires close attention to notice
3 dB	Barely perceptible
5 dB	Quite noticeable
10 dB	Dramatic-twice or half as loud
20 dB	Striking – fourfold change

Source: Wyle Laboratories, Inc. October 2004.

However, on a group or community level, various studies and surveys have shown a correlation between DNL and the percentage of people who consider themselves “highly annoyed.” This correlation is shown on Figure 5-3. This curve, which was originally developed in the 1970s and has been updated over the last 10 years, remains the best available method to estimate community response to aircraft noise.

The sound exposure level (SEL) is a composite metric that represents both the intensity of a sound and its duration. Individual time-varying noise events (e.g., aircraft overflights) have two main characteristics: a sound level that changes throughout the event and a period of time during which the event is heard. The SEL provides a measure of the net impact of the entire acoustic event, but it does not directly represent the sound level heard at any given time. During an aircraft flyover, the SEL would include both the maximum noise level and the lower noise levels produced during onset and recess periods of the overflight.



**Figure 5-3 Influence of Sound Level on Annoyance**

The SEL is a logarithmic measure of the total acoustic energy transmitted to the listener during the event. Mathematically, it represents the sound level of a constant sound that would, in one second, generate the same acoustic energy as the actual time-varying noise event. For sound from aircraft overflights, which typically lasts more than one second, the SEL is usually greater than the maximum sound level ( $L_{\max}$ ) because an individual overflight takes seconds and the  $L_{\max}$  occurs instantaneously. The SEL represents the best metric to compare noise levels from overflights (Wyle Laboratories, Inc. July 2008). Further discussion of the compatibility of land uses within the noise zones is included in Section 5.3.4.

The baseline noise zones for NAS Whidbey Island are presented in Figure 5-4 and were developed using estimated average annual airfield operations (see Table 5-1) and average annual engine maintenance run-ups (Wyle Laboratories, Inc. July 2008). As noted above in Section 5.1, the Navy had previously modeled projected 2013 noise zones that provide verified best available data for this analysis. The off-station area and the estimated 2013 projected population within the modeled noise zones for NAS Whidbey Island are shown in Table 5-3. The population

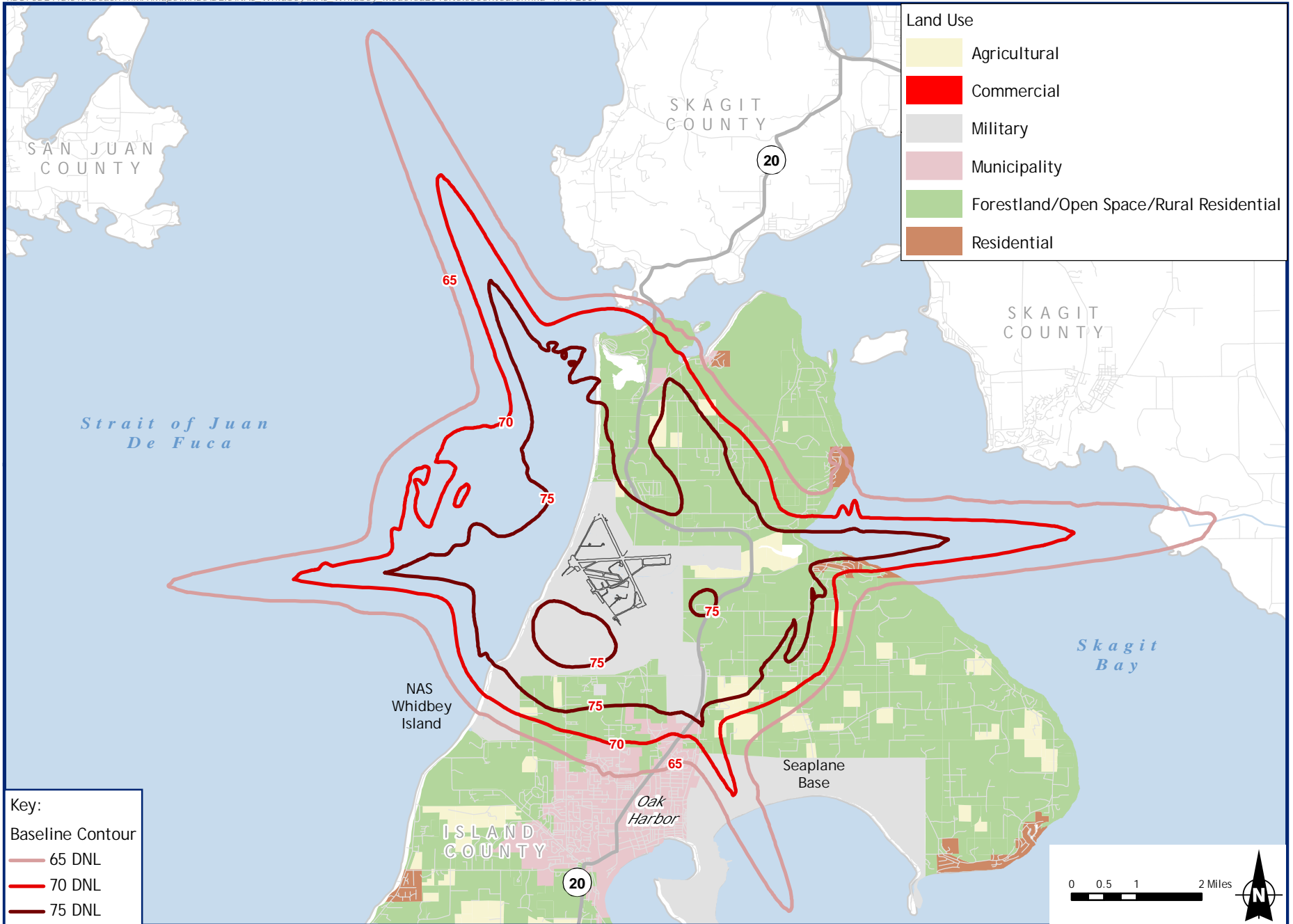


Figure 5-4  
 Modeled 2013 DNL Noise Contours  
 NAS Whidbey Island, Washington

shown is derived by adjusting the 2000 U.S. Census population data by the Island County population growth rate of 1.2% per year.

The greater than 75, 70 to <75, and 65 to <70 dB DNL noise zones extend around Ault Field throughout Island County and surrounding water bodies. To the north is Deception Pass State Park and to the south is the city of Oak Harbor. Most of the land uses surrounding Ault Field and within the existing noise zones are forested and agricultural/open fields, scattered rural residential land, and scattered residential subdivisions at higher densities (see Section 5.3 below).

**Table 5-3 Off-Station Area<sup>1</sup> and Estimated Population<sup>2</sup> within Baseline 2013 Noise Zones for NAS Whidbey Island**

Noise Zone (dB DNL)	Area (Acres)	Area (Square Miles)	Projected 2013 Population
65 to < 70 dB	2,642	4.1	3,179
70 to < 75 dB	3,925	6.1	2,618
75 dB or greater	5,091	8.0	3,055
<b>Total</b>	<b>11,658</b>	<b>18.2</b>	<b>8,852</b>

Source: Wyle Laboratories, Inc. July 2008

Notes:

<sup>1</sup> The area within the 65 dB DNL or greater noise zone does not include the area within the boundary of NAS Whidbey Island or the portion of the noise zone that extends over the Strait of Juan de Fuca and Skagit Bay.

<sup>2</sup> Census data are reported by blocks. The population shown is a proportion of the census block based on the geographic area of the noise zone. These data should be used for comparative purposes only and are not considered actual numbers within the noise zones.

Key:

dB = Decibel.

DNL = Day-night average sound level.

## **5.3 Land Use**

### **5.3.1 NAS Whidbey Island Land Use**

Ault Field occupies 4,337 acres on the north end of Whidbey Island in Island County, Washington. The airfield is bordered on the south by the city of Oak Harbor and on the west by the Strait of Juan de Fuca. Approximately 1,041 acres (24%) of Ault Field has been developed. The remaining land area is undeveloped and supports various vegetation communities and runway clear zones.

The airfield occupies the northeast portion of Ault Field and has two 8,000-foot intersecting runways, Runways 07/25 and 14/32. Aircraft operations areas are located south and west of the runways and include aircraft parking ramps, taxiways, aircraft maintenance hangars, a pas-

senger terminal, an air traffic control tower, aircraft maintenance hangars, and various other support facilities. Other developed areas are scattered throughout Ault Field and include housing and administration, operational support, personnel support, and recreational facilities.

A fence surrounds all of Ault Field, except for the area along the Strait of Juan de Fuca shoreline. Access to the airfield is restricted to military and civilian personnel and authorized visitors.

Seaplane Base is located approximately 5 miles southeast of Ault Field. The base occupies 2,784 acres along 10 miles of Crescent Harbor shoreline. Approximately 23% of the land area is developed and is used for housing and community support facilities, jet fuel off-loading, ordnance storage, and training for the explosive ordnance disposal (EOD) units and other Navy and military commands.

### **5.3.2 Regional Land Use**

The majority of land surrounding Ault Field is rural with large tracts of undeveloped forestland, agricultural land, and scattered residential subdivisions at higher densities (see Figure 5-5). Other land uses in the vicinity of Ault Field include:

- A mixture of residential, light-industrial, and commercial development south of Ault Field in the city of Oak Harbor.
- Commercial and light-industrial uses along State Route 20, which extends along the eastern boundary of Ault Field.
- Deception Pass State Park to the north of Ault Field and Joseph Whidbey State Park to the southwest.
- Various public, private, and Navy-owned marinas, boat launches, campgrounds, beaches, hiking trails, and golf courses.

### **5.3.3 Land-Use Controls**

Development within and around NAS Whidbey Island is controlled, guided, or influenced by the following plans, programs, and policies:

- The Navy and Marine Corps Air Installations Compatible Use Zones (AICUZ) Program;
- The 2004 NAS Whidbey Island Activity Overview Plan (AOP);
- NAS Whidbey Island Integrated Natural Resources Management Plan (INRMP);
- NAS Whidbey Island 1994 Historic and Archaeological Resources Plan;

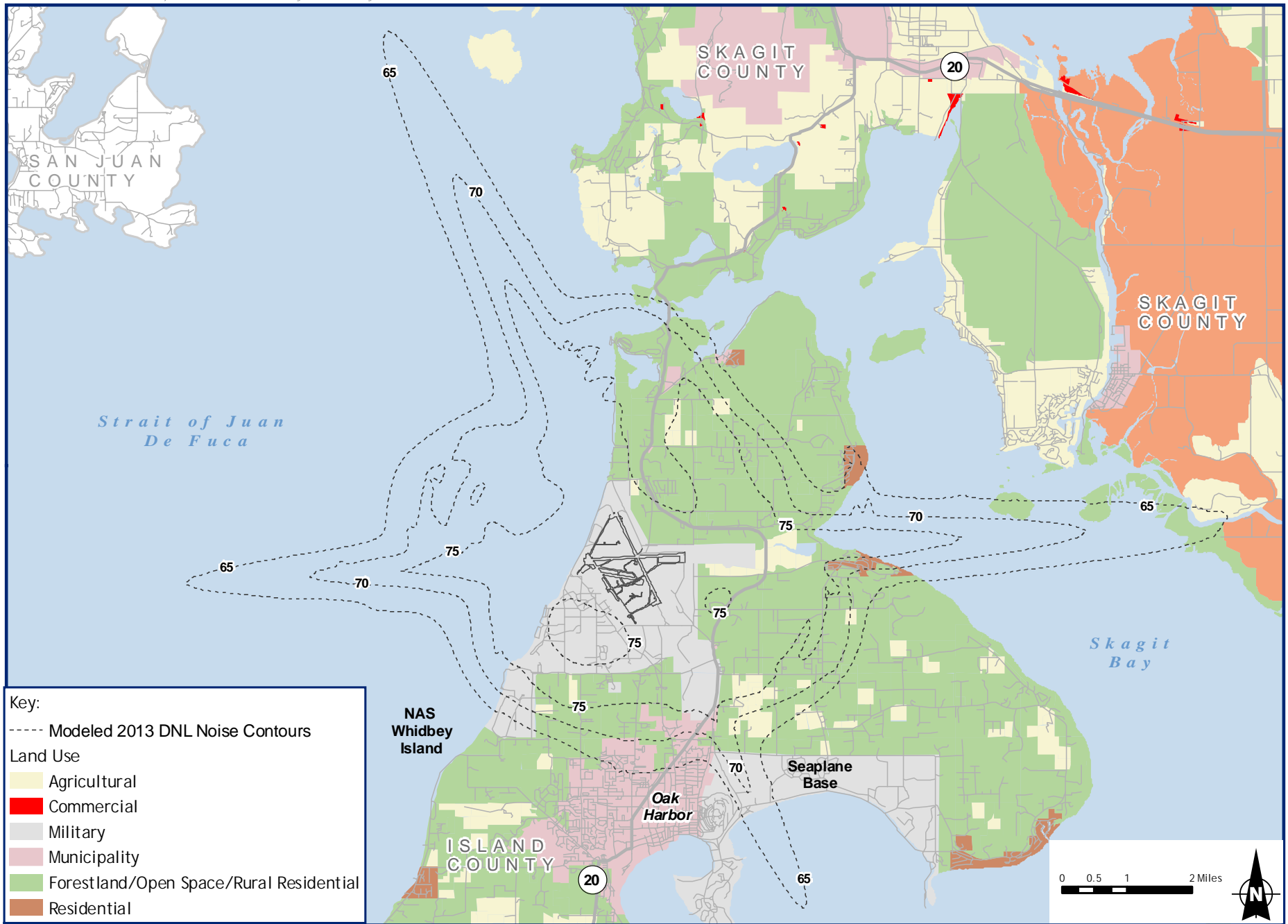


Figure 5-5  
 Existing Land Uses within Modeled 2013 DNL Noise Contours  
 in the Vicinity of NAS Whidbey Island, Washington



- Washington Growth Management Act (WGMA);
- The Island County 2005 Comprehensive Plan and Zoning Code;
- The City of Oak Harbor 2005 Comprehensive Plan and Zoning Code;
- Washington State Coastal Zone Management Program.

### **AICUZ Program**

The AICUZ Program was established in the 1970s by the Department of Defense (DoD) to analyze operational training requirements and to address communities' concerns about aircraft noise and accident potential. The purpose of the AICUZ Program is to achieve compatibility between air installations and neighboring communities by:

- Protecting the health, safety, and welfare of civilians and military personnel by encouraging land use that is compatible with aircraft operations;
- Protecting Navy and Marine Corps installation investment by safeguarding the installation's operational capabilities;
- Reducing noise impacts caused by aircraft operations while meeting operational, training, and flight safety requirements; and
- Informing the public about the AICUZ Program and seeking cooperative efforts to minimize noise and potential aircraft accident impacts.

An AICUZ study analyzes aircraft noise, accident potential, land-use compatibility, and operational procedures and provides recommendations for compatible development near air installations. Federal, state, regional, and local governments are encouraged to adopt guidelines promoting compatible development. The AICUZ Program defines the noise zones and accident potential zones (APZs) that represent the area where land-use controls are needed to protect the health, safety, and welfare of those living near the installation and to preserve the military flying mission.

**Noise.** Under the AICUZ Program, noise zones are identified as the area between the calculated noise contours, based on operations occurring on an average annual day or average busy day (see Section 5.2 above). For land-use planning purposes, the noise zones are grouped into three noise zones. Noise Zone 1 (less than 65 dB DNL) is generally considered an area of low or no noise impact. Noise Zone 2 (65 to 75 dB DNL) is an area of increased impact where some land use controls are required. Noise Zone 3 (more than 75 dB DNL) is the highest impacted area and requires the greatest degree of land-use control.

**APZs.** The number and type of airfield operations are also used as the basis for identifying APZs around an airfield. While the likelihood of an aircraft mishap occurring is remote, the Navy identifies areas of accident potential to assist in land-use planning. APZs are areas where an aircraft mishap is most likely to occur and is delineated based on historical data and departure, arrival, and pattern flight tracks on and near the airfield runways. The Navy recommends that local planning agencies plan for and construct developments that concentrate large numbers of people, such as apartments, churches, and schools, outside the APZs.

APZs include three restricted areas, with the areas nearest the runways having the most restrictions. These areas, the Clear Zone, APZ 1, and APZ 2, are configured as follows:

- **Clear Zone.** The Clear Zone extends 3,000 feet beyond the end of the runway; it measures 1,500 feet wide at the end of the runway and 2,284 feet wide at its outer edge.
- **APZ 1.** APZ 1 extends 5,000 feet beyond the Clear Zone, with a width of 3,000 feet at its outer edge. APZ 1 is typically rectangular, although it may curve to conform to the predominant flight track.
- **APZ 2.** APZ 2 extends 7,000 feet beyond APZ 1, with a width of 3,000 feet. This zone is typically rectangular, although it too may conform to the curve of the predominant flight track.

Although ultimate control over land use and development in the vicinity of military facilities is the responsibility of local governments, the Navy recommends, through its AICUZ Program, that localities adopt programs, policies, and regulations to promote compatible development where appropriate and feasible near Naval and Marine Corps air installations. Such land-use recommendations by the Navy are intended to serve as guidelines; they are based on the assumption that noise-sensitive uses (e.g., houses, churches, hospitals, amphitheaters, etc.) should be located outside the high-noise zones and people-intensive uses should not be located in APZs. The purpose of the Navy's land-use recommendations is not to preclude productive use of land around Navy and Marine Corps air installations but to recommend best uses of the land that are protective of human health, safety, and welfare. The Navy's recommendations can be implemented by ensuring development restrictions are placed on noise-sensitive uses in high-noise zones and on people-intensive uses in APZs as well as fair disclosure in real estate transactions and use of sound-attenuating construction.

The NAS Whidbey Island AICUZ Program was established in 1977. This program was updated in 1986 and again in 2005 to account for changes in aircraft mix, tempo of aviation activity, and maintenance procedures. The APZs used in this EIS are from the 2005 AICUZ update (Naval Facilities Engineering Command Southwest May 2005). These APZs are representative of conditions at the base projected to occur before the P-8A MMA are based at NAS Whidbey Island and once the Navy fully transitions from the EA-6B to the EA-18G aircraft. The APZs are shown on Figure 5-6. As can be seen, the majority of the clear zones for NAS Whidbey Island are located on-station or offshore in the Strait of Juan de Fuca. The boundaries of APZ 1 and APZ 2 extend off-station into the local community.

### **NAS Whidbey Island Activity Overview Plan (AOP)**

The AOP is a comprehensive land use and facilities plan supporting the long-range vision (15 to 20 years) for NAS Whidbey Island. Prepared in 2004, the AOP is a planning tool for the station and incorporates information from special studies such as the NAS Whidbey Island Airfield Recapitalization Plan. The AOP includes an analysis of the station's future aircraft and squadron-loading scenarios, including replacement of the P-3C aircraft with the P-8 MMA; baseline conditions and future operational needs of the mission-critical, mission-support, and personnel-support departments; and analysis of development constraints and development opportunity areas.

The AOP also contains a Strategic Action Plan that identifies land-use policy, land-holdings strategy, and project recommendations. Among these recommendations is the protection of NAS Whidbey Island as a critical Navy air operations asset. The AOP recommends that siting new facilities be consistent with flight line expansion areas and land-use restrictions to limit encroachment on operations.

### **Integrated Natural Resources Management Plan (INRMP)**

The Navy prepared an INRMP in 1996 for NAS Whidbey Island in compliance with DoD Instruction 4715.3 and the Sikes Act (16 United States Code [U.S.C.] 670a et seq.). The overall goal of the 1996 plan is to integrate management activities with all programs and mission requirements while sustaining, promoting, and restoring the health and integrity of NAS Whidbey Island ecosystems. The INRMP identifies land, water, plant, fish, and wildlife resources on the

installation. The document serves as a tool to guide both short-term resource management activities and long-range planning.

The NAS Whidbey Island Environmental Affairs Department is responsible for programmatic oversight, management, and supervision of natural resources management at the air station.

### **Historic and Archaeological Resources Protection Plan (HARP)**

The Navy prepared a HARP in 1994 (Dames and Moore 1994) for NAS Whidbey Island with the goal of protecting and managing cultural resources at the station to prevent or avoid potential adverse effects of military training and new development. The plan summarizes previous archaeological investigations and historic surveys that have been completed at the station and identifies management actions that should be completed in compliance with Section 106 and Section 110 of the National Historic Preservation Act (NHPA). The overall goal of the HARP is to assist NAS Whidbey Island in meeting its statutory and regulatory requirements for identification and protection of cultural resources in a manner that is compatible with the facility's mission.

### **Washington State Growth Management Act**

The Growth Management Act (GMA) was adopted in 1990 because the Washington State legislature found that uncoordinated and unplanned growth posed a threat to the environment, sustainable economic development, and the quality of life in Washington. The GMA requires state and local governments to manage Washington's growth by identifying and protecting critical areas and natural resource lands, designating urban growth areas, and preparing comprehensive plans and implementing them through capital investments and development regulations. The GMA has been amended several times, including in 2005, when provisions were added to address development around military installations. The 2005 amendment recognizes that military installations are of particular importance to the economic health of Washington's economy and quality of life. As such, the GMA requires that county and city comprehensive plans restrict development in the vicinity of military installations that is incompatible with the installation's ability to carry out its mission requirements.

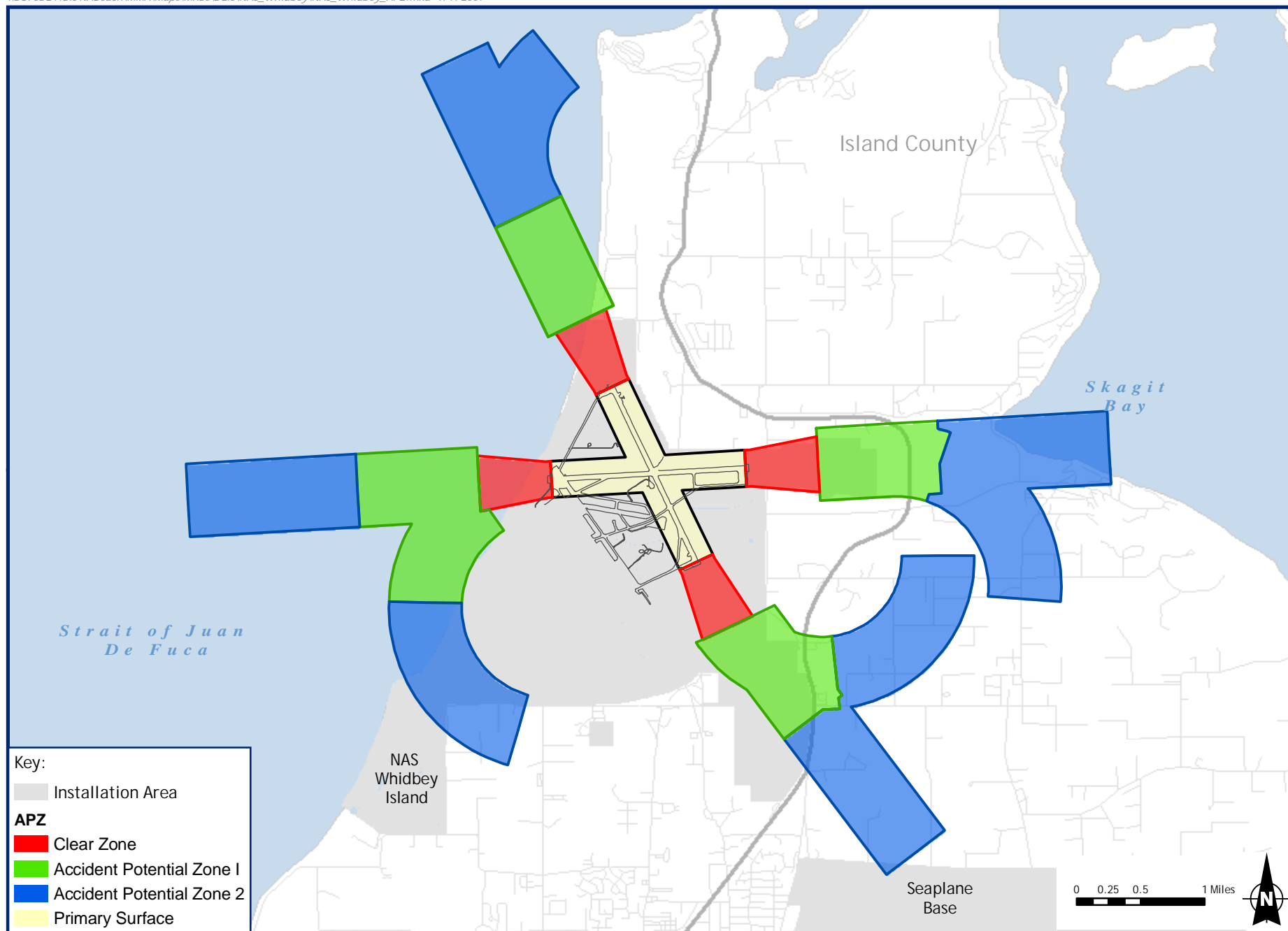


Figure 5-6  
AICUZ APZs  
NAS Whidbey Island, Washington

### **Island County Comprehensive Plan and Zoning Code**

Washington State law requires every jurisdiction to have a comprehensive, long-term plan for its future development. The Island County Comprehensive Plan is a guide for the county on how to approach growth and development. The original Island County Comprehensive Plan was adopted in 1984. The Board of County Commissioners adopted a more comprehensive and integrated document in 1998 (Board of Island County Commissioners et al. 1998) consisting of ten elements or chapters; this was most recently updated in 2002.

The Comprehensive Plan acknowledges the county's association with NAS Whidbey Island as well as the impacts associated with aircraft operations at Ault Field. The plan designates an "Airport and Aviation Safety Overlay," which recommends that future land use adjacent to Ault Field be maintained as rural and rural agricultural. These areas are designated rural and rural agricultural to encourage low-density development within the air station's noise zones.

Zoning is the primary land-use control used by Island County to control development on non-federal land. Island County adopted the noise contours from the 1993 noise study published in the draft Environmental Impact Statement for the Management of Air Operations at NAS Whidbey Island (U.S. Department of the Navy 1993) to implement the Airport and Aviation Safety Overlay District of the county's zoning code. The majority of parcels under county jurisdiction near Ault Field and within the overlay district are zoned as rural or rural agriculture. The rural zone generally limits development density to one unit per 5 acres, while the rural agriculture zone generally limits development density to one lot per 10 acres.

Island County has also adopted an Airport and Aircraft Operations Noise Disclosure Ordinance for property sold, rented, or leased within the noise zones around Ault Field. The disclosure ordinance gives notice to prospective buyers, renters, or lessees that the property of interest is subject to aircraft noise for the northern two-thirds of Island County. Island County also enforces a separate Noise Level Reduction Ordinance that sets minimum standards for building construction within the noise zones around Ault Field.

### **City of Oak Harbor Comprehensive Plan and Zoning Ordinance**

Maintaining land-use compatibility with NAS Whidbey Island is of paramount importance to the city of Oak Harbor (City of Oak Harbor October 2005). A stated goal/policy objec-

tive in the Comprehensive Plan is to prohibit residential development in any area above the 70 dB DNL contour. Additionally, the plan promotes residential development to the southwest and away from Ault Field.

The city of Oak Harbor has adopted the same noise contours as Island County to implement the Aviation Environs Overlay Zone through the city's zoning ordinance and other elements of the municipal code. Land uses within the Aviation Environs Overlay Zone are designated for low-density development. The overlay applies additional standards to properties located within underlying zoning districts. These standards include noise-level reduction requirements ranging between 25 dB and 30 dB, depending on structure type and location within noise zones and disclosure. The city of Oak Harbor has also adopted a lighting and glare ordinance, helping to ensure the safety of aircraft operations by placing limitations on lighting that can impair a pilot's vision, especially at night.

### **Washington State Coastal Zone Management (CZM) Program**

NAS Whidbey Island is located within the state of Washington's coastal zone. The Coastal Zone Management Act (CZMA) of 1972 (16 U.S.C. 1451 et seq., as amended) encourages states to develop management plans for coastal zones in order to protect natural resources and shoreline-related commercial land uses of the nation's shorelines. Section 307 of the CZMA stipulates that where a federal project initiates reasonably foreseeable effects on any coastal use or resource (land or water use or natural resource), the action must be consistent to the "maximum extent practicable with the enforceable policies of approved State management programs" (16 U.S.C. 1456 (c)(1)(A)).

The state of Washington has developed and implemented a federally approved Coastal Management Program describing current coastal legislation and enforceable policies. The Washington Coastal Zone Management Program provides management of the coastal zone within the 15 counties containing the state's coastal resources. It is implemented by the Washington State Department of Ecology through the Shorelands and Environmental Assistance Program. Under the program, activities that impact any land use, water use, or natural resource of the coastal zone must comply with six laws, or "enforceable policies." These include the Shoreline Management Act (SMA); the State Environmental Policy Act (SEPA); the Clean Air Act (CAA), the Clean

Water Act (CWA); the Energy Facility Site Evaluation Council (EFSEC), and the Ocean Resource Management Act (ORMA).

Federal lands such as NAS Whidbey Island, which are “lands the use of which is by law subject solely to the discretion of the Federal Government, its officers, or agency,” are statutorily excluded from the CZMA’s definition of the “coastal zone” (16 U.S.C. Section 1453(1)). If, however, the proposed federal activity affects coastal uses or resources beyond the boundaries of the federal property (i.e., has spillover effects), the CZMA Section 307 federal consistency requirement applies.

#### **5.3.4 Land-Use Compatibility Assessment**

To determine the compatibility of land use with existing aircraft operations at NAS Whidbey Island, maps of AICUZ noise zones for the station were overlaid on the city of Oak Harbor and Island County land-use maps. As previously discussed, the AICUZ noise zones for NAS Whidbey Island are representative of conditions at the station projected to occur once the Navy fully transitions from the EA-6B to the EA-18G aircraft and before the MMA are home-based at Whidbey Island. Land-use designations within the AICUZ noise zones were compared with the Navy/Marine Corps land-use compatibility recommendations under its AICUZ program (see Appendix G).

Portions of the city of Oak Harbor and Island and Skagit counties are within the AICUZ noise zones for NAS Whidbey Island (see Figure 5-5). Table 5-4 provides the total area, by land-use category, within the 65 to 70 dB DNL, 70 to 75 dB DNL, and greater-than-75 dB DNL noise zones around Ault Field. According to the AICUZ guidelines all land-use categories in the less-than-65 dB DNL noise zone are considered to be compatible.

As shown on Figure 5-5 and Table 5-4, approximately 95% of the land uses within the noise zones around Ault Field are considered compatible land uses, including forestland/open space/rural residential, agricultural, military and water. Approximately 3% of the total area within the greater-than-65 dB DNL noise zone consists of residential and municipal uses, which are generally considered to be incompatible with aircraft operations.



**Table 5-4 Existing Land Uses within AICUZ Noise Zones around Ault Field**

Land Use	Noise Zone (acres)			Total Acres (% of Total Land Use)
	65 to 70 dB DNL	70 to 75 dB DNL	>75 dB DNL	
Residential	150	80	7	237 (<1)
Municipality	400	223	10	633 (2)
Park	270	470	0	740 (2)
Forestland/Open Space/ Rural Residential	1,767	2,905	4,455	9,127 (28)
Agriculture	154	243	529	926 (3)
Water	7,610	5,418	4,011	17,039 (51)
Military	439	864	3,154	4,457 (13)
<b>Total</b>	<b>10,790</b>	<b>10,203</b>	<b>12,166</b>	<b>33,159</b>

Source: Island County Land Use and Zoning Maps

Key:

dB = Decibel.

DNL = Day-night average sound level.

## 5.4 Air Quality

### 5.4.1 Air Quality Regulations

The CAA is the primary federal statute governing the control of air quality. The CAA designates six pollutants as “criteria pollutants” for which National Ambient Air Quality Standards (NAAQS) have been established to protect public health and welfare. These include particulate matter less than 10 microns in diameter (PM<sub>10</sub>), carbon monoxide (CO), sulfur dioxide (SO<sub>2</sub>), nitrogen dioxide (NO<sub>2</sub>), lead (Pb), and ozone (O<sub>3</sub>). Areas that do not meet NAAQS for criteria pollutants are designated as “nonattainment areas” for that pollutant. Areas that achieve the air quality standard after being designated nonattainment are redesignated as attainment following EPA approval of a maintenance plan. Under the CAA, state and local agencies may establish ambient air quality standards (AAQS) and regulations of their own, provided these are at least as stringent as the federal requirements. Table 5-5 summarizes the federal and state AAQS.

Under the General Conformity Rule, federal actions in nonattainment areas or maintenance areas must conform to an applicable State Implementation Plan (SIP), and a General Conformity Determination is prepared for that action. However, Island County is in attainment of the NAAQS for all criteria pollutants. Because the region is in attainment, the CAA General Conformity Rule does not apply and a General Conformity Determination is not required.

**Table 5-5 National and Washington State Ambient Air Quality Standards**

Pollutant	Averaging Time	NAAQS <sup>1</sup>		Washington AAQS <sup>2</sup> Concentration <sup>5</sup>
		Primary <sup>3</sup>	Secondary <sup>4</sup>	
Ozone (O <sub>3</sub> ) <sup>6</sup>	1-Hour	—	—	0.12 parts per million (ppm) (235 micrograms per cubic meter [µg/m <sup>3</sup> ])
	8-Hour	0.08 ppm	—	Same as NAAQS
Carbon Monoxide (CO)	8-Hour	9.0 ppm (10 µg/m <sup>3</sup> )	None	Same as NAAQS
	1-Hour	35 ppm (40 µg/m <sup>3</sup> )	—	Same as NAAQS
Nitrogen Dioxide (NO <sub>2</sub> )	Annual Average	0.053 ppm (100 µg/m <sup>3</sup> )	Same as Primary Standard	Same as NAAQS
Sulfur Dioxide (SO <sub>2</sub> )	Annual Average	0.03 ppm (80 µg/m <sup>3</sup> )	—	0.02 ppm (60 µg/m <sup>3</sup> )
	24-Hour	0.14 ppm (365 µg/m <sup>3</sup> )	—	0.1 ppm (260 µg/m <sup>3</sup> )
	3-Hour	—	0.5 ppm (1300 µg/m <sup>3</sup> )	Same as NAAQS
	1-hour	—	—	0.4 ppm more than once per year  0.25 ppm more than two times per/week
Suspended Particulate Matter (PM <sub>10</sub> )	24-Hour	150 µg/m <sup>3</sup>	Same as Primary Standard	Same as NAAQS
	Annual Arithmetic Mean	50 µg/m <sup>3</sup>		Same as NAAQS
Fine Particulate Matter (PM <sub>2.5</sub> ) <sup>6</sup>	24-Hour	65 µg/m <sup>3</sup>	Same as Primary Standard	—
	Annual Arithmetic Mean	15 µg/m <sup>3</sup>		—
Lead (Pb)	30-Day Average	—	—	1.5 µg/m <sup>3</sup>
	Calendar Quarter	1.5 µg/m <sup>3</sup>	Same as Primary Standard	—
Lead (Pb)	30-Day Average	—	—	1.5 µg/m <sup>3</sup>
	Calendar Quarter	1.5 µg/m <sup>3</sup>	Same as Primary Standard	—

Source: Washington State Department of Ecology 2007; U.S. Environmental Protection Agency 2007.

Notes:

<sup>1</sup> NAAQS (other than O<sub>3</sub>, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The O<sub>3</sub> standard is attained when the fourth highest 8-hour concentration in a year, averaged over three years, is equal to or less than the standard. For PM<sub>10</sub>, the 24-hour standard is attained when 99% of the daily concentrations, averaged over three years, are equal to or less than the standard. For PM<sub>2.5</sub>, the 24-hour standard is attained when 98% of the daily concentrations, averaged over three years, are equal to or less than the standard. Contact the EPA for further clarification and current federal policies.

<sup>2</sup> Washington State Ambient Air Quality Standards from Washington Administrative Code 173 Regulations.

<sup>3</sup> National Primary Standards: The levels of air quality necessary, with an adequate margin of safety, to protect the public health.

<sup>4</sup> National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

<sup>5</sup> Concentration expressed first in units in which it was promulgated. Ppm in this table refers to ppm by volume or micromoles of pollutant per mole of gas.

<sup>6</sup> New federal 8-hour ozone and fine particulate matter standards were promulgated by the EPA on July 18, 1997. On June 15, 2005 the EPA issued attainment designations for the 8-hour standard and established areas no longer under maintenance for the 1 hour-ozone Standard (U.S. Environmental Protection Agency 2007).

### 5.4.2 Existing Emissions

The Northwest Clean Air Agency (NWCAA) is the regional agency responsible for overseeing the state's operating permit program for Island, Skagit, and Whatcom counties. NAS Whidbey Island is the only major source of stationary emissions in Island County, although other major sources are located in Skagit and Whatcom counties. NAS Whidbey Island operates under a Title V Operating Permit approved by the NWCAA in 1999. The stationary sources regulated under the issued permit include aviation gasoline storage tanks; jet engine test cells; painting, cleaning, and repair operations; and boilers, furnaces, and generators. In accordance with the Title V Operating Permit, total stationary source emissions are reported on an annual basis.

The activities that would be affected by this action are limited to the replacement of the three P-3C squadrons based at NAS Whidbey. Emissions of criteria pollutants result from aircraft flight operations and maintenance (run-ups and test cell) of the aircraft. Aircraft emissions were calculated using emission factors provided by the Navy's Aircraft Environmental Support Office (AESO) and operations information from station personnel (Wyle Laboratories, Inc. October 2004). Emissions also result from the operation of personally owned vehicles (POVs) that are used by station personnel to commute to work. Emissions from the vehicles of P-3C personnel have been calculated. Annual emissions from the operations of P-3C aircraft and the POVs of personnel affected by this action are summarized in Table 5-6. See Appendix H for information on emission calculations.

**Table 5-6 Emissions Criteria Pollutants from P-3C Aircraft, NAS Whidbey Island, Washington (Projected Baseline Year: 2011)**

Operation	Baseline Emissions (tpy)				
	CO	NO <sub>x</sub>	HC	SO <sub>2</sub>	PM <sub>10</sub>
Flight Operations	34.7	52.1	20.7	2.6	23.6
Maintenance	19.1	7.0	13.0	0.5	4.1
<b>P-3C Total</b>	<b>53.8</b>	<b>59.1</b>	<b>33.7</b>	<b>3.1</b>	<b>27.7</b>
POVs	33.5	3.4	3.5	0.1	0.4
<b>Total</b>	<b>87.4</b>	<b>62.5</b>	<b>37.2</b>	<b>3.1</b>	<b>28.1</b>

### 5.5 Socioeconomics

Currently available data on population, housing, employment, taxes and revenue, and education were used to project the socioeconomic conditions in the baseline year, 2011. The

discussion below indicates the assumptions made and describes how the final estimated numbers were reached. A full discussion of the methodologies used can be found in Appendix I.

## **5.5.1 Population and Housing**

### **5.5.1.1 Population**

#### **NAS Whidbey Island**

NAS Whidbey Island is located in Island County in the coastal area of the state of Washington. The base is the major employer in the county, with more than 7,000 military personnel stationed there and an additional 2,000 civilians and contractors employed by the base. The overall population of NAS Whidbey Island has fluctuated slightly over the years, with a projected 2011 base-loading of 9,033, which would be lower than average 1996 levels (see Table 5-7).

**Table 5-7 Personnel Loading Summary for NAS Whidbey Island**

	<b>1996</b>	<b>2000</b>	<b>2005</b>	<b>2011</b>	<b>% Change from 1996 to 2011</b>
Military	7,995	7,771	8,581	7,032	(-)12%
Civilians	895	730	627	759	(-)15%
Contractors	1,316	1,311	NA	1,242	(-)6%
<b>Total</b>	<b>10,206</b>	<b>9,812</b>	<b>9,208*</b>	<b>9,033</b>	<b>(-)11%</b>

Sources: Mytych, L. 2007; U.S. Department of the Navy January 2005

Note:

\* This base total figure does not include contractors because the information for 2005 was not available.

It was estimated that the majority of the personnel stationed and employed by NAS Whidbey Island live within Island County (approximately 85%). This would include those living in military housing as well as those renting or owning in the neighborhoods surrounding the base. The city of Oak Harbor is home to more than 44% of those individuals stationed or employed by NAS Whidbey Island (see Table 5-8).

#### **Island County and Region**

According to the U.S. Census Bureau, Island County has been experiencing significant growth. Assuming an annual growth rate of 1.2%, the population is estimated to increase by 13% from 2000 to 2010. Similar trends from 1990 to 2005 are evident in the smaller municipali-

ties throughout the county, and it is anticipated that they would follow the overall trend of growth seen with the 2010 projections of the county.

**Table 5-8 Residential Location of Personnel Stationed and Employed at NAS Whidbey Island**

County/Municipality	% of Personnel
Island County	
NAS Whidbey Island	37.0
City of Oak Harbor	44.6
Coupeville	3.7
<b>Subtotal</b>	<b>85.3</b>
Skagit County	
Anacortes	4.8
Mount Vernon	3.2
<b>Subtotal</b>	<b>8.0</b>
Other (municipalities in various counties each with <3%)	6.7
<b>Total</b>	<b>100</b>

Source: U.S. Department of the Navy January 2005.

Table 5-9 presents specific population estimates for Island County, Oak Harbor, Coupeville, and Anacortes. These municipalities were selected as a study area based upon information suggesting these are the primary areas where people who are stationed or employed by NAS Whidbey Island currently live.

**Table 5-9 Regional Population around NAS Whidbey Island (2000-2010)**

County/Municipality	1990	2000	2005	2010	% Change from 2000 to 2010
Island County	60,195	71,558	79,983	80,650 <sup>2</sup>	13%
City of Oak Harbor	17,176	19,905	21,720 <sup>1</sup>	N/A	N/A
Coupeville	1,377	1,723	1,785 <sup>1</sup>	N/A	N/A
Anacortes	11,451	14,707	15,700 <sup>1</sup>	N/A	N/A

Source: U.S. Census Bureau 2000 (except where noted)

Notes:

<sup>1</sup> State of Washington Office of Financial Management 2006.

<sup>2</sup> State of Washington Office of Financial Management 2002.

### 5.5.1.2 Housing

#### NAS Whidbey Island

Military personnel stationed or civilians employed at NAS Whidbey Island reside either in military bachelor or privatized military family housing or in private housing within the communities surrounding the station. NAS Whidbey Island uses the Office of the Secretary of De-

fense Housing Requirement Determination Process Policy Guidance in determining the housing requirements the Navy is required to provide on-station. According to this guidance, the Navy would rely first on the private sector to provide housing for military personnel within the NAS Whidbey Island Housing Market Area. Only when the private sector is not capable of providing military members with housing should the construction, operation, and maintenance of government housing be considered.

The Navy would provide housing to eligible military personnel stationed at NAS Whidbey Island in either bachelor (officer and enlisted) quarters or family housing units if the private sector is unable to accommodate the personnel.

According to the *2004 NAS Whidbey Island Housing Market Analysis* (Science Applications International Corporation June 17, 2004) the Navy provides 1,552 military family housing units and 1,581 bachelor housing units for military personnel stationed at NAS Whidbey Island, out of a requirement of 4,452 families and 3,460 bachelor personnel. In 2003-2004, on-station housing accommodated approximately 35% of the military families stationed at NAS Whidbey Island (17 units were unoccupied) and approximately 46% of the bachelor enlisted and officers stationed there (Science Applications International Corporation June 17, 2004). The remaining military personnel rent or own housing in the local community. The local community surrounding NAS Whidbey Island is able to accommodate a large percentage of the personnel stationed or employed by the base.

The *Housing Market Analysis* projects an overall increase in the number of military personnel in 2009, including both Navy and tenant personnel, that NAS Whidbey Island would be responsible for housing. An adequate supply in the combined private sector and military family housing is still projected (with a surplus of approximately 40 units) in this scenario (see Table 5-10).

From 2004 to 2009 the overall number of bachelors requiring housing would decrease from 2,474 to 2,400 at the same time that total bachelor housing capacity would be reduced from 1,571 to 1,140. This would result in a deficit of 1,260 housing units for bachelors (see Table 5-11) (Science Applications International Corporation June 17, 2004). It should be noted that a deficit in adequate housing indicates that the housing does not meet requirements based upon military personnel rank. Specific housing data were not available for the actual years involved in

the proposed action. The data for 2004 and 2009 were the best available data and were used in this analysis.

**Table 5-10 Housing Availability (2000) for Military Family Housing**

<b>NAS Whidbey Island</b>	<b>2004</b>	<b>2009</b>
Military Family Requirement	4,452	4,572
Floor Requirement	445	457
Private Sector Housing Shortfall	1,090	1,046
<b>Total Military Family Housing (MFH) Requirement</b>	<b>1,535</b>	<b>1,503</b>
MFH Inventory	1,552	1,543
<b>Surplus/(Deficit) of Military Family Housing Assets</b>	<b>(-)17</b>	<b>(-)40</b>

Source: Science Applications International Corporation June 17, 2004

**Table 5-11 Housing Availability for Bachelor Quarters**

<b>NAS Whidbey Island</b>	<b>2004</b>	<b>2009</b>
<b>Bachelor Housing Requirement</b>	3,460	3,502
On-Base Requirement	1,166	1,173
Private Sector Shortfall	1,308	1,227
Total Bachelors Requiring Government Quarters	<b>2,474</b>	<b>2,400</b>
<b>Bachelor Housing Capacity</b>	1,581	1,140
<b>Surplus/(Deficit) of Bachelor Housing Capacity</b>	<b>(-)893</b>	<b>(-)1,260</b>

Source: Science Applications International Corporation June 17, 2004

In addition to the bachelor and family housing at NAS Whidbey Island, there are 212 units of visiting quarters/transient quarters that provide housing when needed (Shaddy-Brown February 15, 2007).

### **Island County and Region**

The number of housing units in Island County and other local municipalities in proximity to NAS Whidbey Island increased significantly from 1990 to 2000, keeping pace with the increasing population during that period. From 1990 to 2000, the total housing units in Island County increased by more than 6,500 units, or 25.2% (U.S. Census Bureau 2007). Similar increases were experienced in Oak Harbor (25.3%), Coupeville (28.5%), and Anacortes (31.1%). Some municipalities in the study area, such as the city of Oak Harbor, have a very high renter-occupancy rate, most likely because the base is close by and military personnel can rent in the local community rather than living on-station. Table 5-12 provides further detail for the regional housing market surrounding NAS Whidbey Island.

**Table 5-12 Regional Housing Availability (2000) around NAS Whidbey Island**

	Housing Units				Vacancy Rate (%)
	Owner-Occupied	Renter-Occupied	Vacant	Total	
Island County	19,488	8,296	4,594	32,378	14.2%
City of Oak Harbor	3,191	4,158	387	7,736	12.1%
Coupeville	482	265	73	820	15.1%
Anacortes	4,228	1,888	431	6,547	10.2%

Source: U.S. Census Bureau 2005

The vacancy rates for these geographic areas range from 10% to 14%, which is considered high, compared with the national average of 9%. However, these areas are used for recreational purposes and many housing units may be second home or vacation properties. For example, of the 4,594 vacant units in Island County, approximately 70% are “for seasonal, recreational, or occasional use.” This percentage is not as high for the other geographic areas, but it is still considerable and contributes to the relatively high vacancy rate (U.S. Census Bureau 2005).

## **5.5.2 Economy**

### **5.5.2.1 NAS Whidbey Island**

According to a 2004 report analyzing the economic impact of the military in the state of Washington, it was estimated that nearly 88% of all economic activity in Island County is directly and indirectly linked to the Navy presence, specifically NAS Whidbey Island (State of Washington Office of Financial Management 2004). This included such direct impacts as employment, payrolls, retiree pension, payments to private health care providers, and purchases of goods and services from local vendors (see Table 5-13).

This study estimates that NAS Whidbey Island directly and indirectly accounts for nearly 17,500 jobs within Island County and more than 20,100 statewide, producing labor earnings of \$674 million in Island County and \$775 million statewide based upon 2003 employment and earnings estimates (State of Washington Office of Financial Management 2004).

### **5.5.2.2 Island County and Region**

Island County is within the Seattle-Tacoma-Bellevue Metropolitan Statistical Area (MSA). Approximately 25% of Island County residents commute beyond the county limits for employment, primarily to Snohomish, King, and Skagit counties (State of Washington Office of



Financial Management 2004). However, due to concerns about limited off-island linkages, Island County is working to develop more commercial centers and light industry that would provide employment opportunities for county residents (U.S. Department of the Navy January 2005).

**Table 5-13 Direct Impacts of Major Military Bases<sup>1</sup> in Island County (2003)**

<b>Employment, Uniformed and Civilian</b>		<b>10,066</b>
Payroll		\$399.1 million
Military retiree pensions		\$91.1 million
TriCare payments to private providers		\$14.1 million
Contracts for goods and services		\$12.2 million
On-base retail spending		\$22.0 million
<b>Net direct spending<sup>2</sup></b>		<b>\$494.5 million</b>

Source: State of Washington Office of Financial Management 2004

Note:

<sup>1</sup> Specifically NAS Whidbey Island.

<sup>2</sup> Reduced by on-base retail spending.

In 2006, the total unemployment rate for Island County was 5.2% of the total labor force (U.S. Department of Labor 2007). This was slightly higher than both the Seattle-Tacoma-Bellevue primary MSA (PMSA) and the state of Washington and may be due to the isolation of the Island County population (see Table 5-14).

As stated previously, NAS Whidbey Island is a major employer in the county, both directly and indirectly. Besides employment in the federal, state, or local government sector, Island County employment includes the retail, construction, real estate, health care, and accommodation and food services sectors (U.S. Department of the Navy January 2005).

**Table 5-14 Percentage of Unemployed in the Seattle-Tacoma-Bellevue Island County MSA and the State of Washington (2000 – 2006)**

<b>Year</b>	<b>State of Washington</b>	<b>Seattle-Tacoma-Bellevue PMSA</b>	<b>Island County</b>
2000	5.0	4.3	5.0
2001	6.2	5.4	6.1
2002	7.3	6.7	7.4
2003	7.4	6.8	7.6
2004	6.3	5.7	6.9
2005	5.5	5.0	5.9
2006	5.0	4.5	5.2

Source: U.S. Department of Labor 2007

### **5.5.3 Taxes and Revenues**

According to the 2007 Adopted Island County Budget, the gross annual budget for the county was \$68.5 million. Major sources of revenue for Island County were real and personal property taxes, local sales taxes, Washington State Department of Transportation funds for county roads, and solid waste removal fees, with the remainder of the county revenue being supplied by the state or federal government (Island County Board of County Commissioners 2006).

Based upon the 2007 budget and the estimated 2005 population for Island County, the local per capita tax burden is \$856 for county-related taxes.

### **5.5.4 Education**

There are ten schools in the Oak Harbor School District, serving a total student population of approximately 5,600. In the 2006-2007 school year the district employed 650 faculty and staff and had an operating budget of approximately \$46 million (Oak Harbor School District 2007). The district schools include five elementary schools, two middle schools, and one high school. In addition, there is a second high school for 100 alternative learners in grades 9 through 12 and a school facility for students being homeschooled to provide additional school district resources (Oak Harbor School District 2007).

Currently no accurate enrollment and capacity statistics for individual schools are available because of recent changes in elementary and middle school boundaries for the 2007-2008 school year. However, the Oak Harbor School District was at 95% capacity at the beginning of the 2007-2008 school year (Hunt August 8, 2007). Many students in the Oak Harbor school district are military dependents. Overall, it is estimated that 54% of the total school district enrollment are military dependents (Hunt August 8, 2007). Data from the 2006-2007 school year indicates the highest percentage of military dependents at the elementary grade level (88%) was in Olympic View Elementary. The two middle schools were fairly even, with 58% of North Whidbey Middle School being military dependents and 55% at Oak Harbor Middle School. At Oak Harbor High School, 48% were military dependents (Oak Harbor School District 2007).

The federal government compensates school districts for schooling the dependents of federal employees, including service personnel. School districts in Island County (primarily the Oak Harbor School District) receive approximately \$4.5 million annually in impact aid for

schooling dependents of military personnel (State of Washington Office of Financial Management 2004).

### **5.5.5 Environmental Justice**

Consistent with Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* (February 11, 1994), the Navy's policy is to identify and address disproportionately high and adverse human health or environmental effects of its actions on minority and low-income populations. In addition, Executive Order 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, enacted in 1997, directs federal agencies to identify and assess environmental health and safety risks to children, coordinate research priorities on children's health, and ensure that their standards take into account special risks to children.

This analysis focuses on the potential for a disproportionate and adverse exposure of these specific off-base population groups to the projected aircraft noise under the alternatives at each base where the "greater than 65 DNL noise exposure" would be the greatest. The results of the analysis of these scenarios are similar, whether using the alternative with the most squadrons allocated to that base or the least number, the only exception being alternatives where no P-8A MMA squadrons are proposed.

In this analysis, minority and low-income populations and children were defined as follows:

- **Minority.** Individuals who are Black/African-American, Asian, Pacific Islander, American Indian, Eskimo, Aleut, or other non-white persons (a separate distinction has been made for people of Hispanic origin).
- **Low-Income.** Individuals living below the poverty level as defined by the U.S. Census Bureau.
- **Children.** Individuals under the age of 18.

Statistics pertinent to the study area surrounding NAS Whidbey Island are summarized in Table 5-15 below. (Section 6.5.5 presents data on the census tracts that would be most affected by aircraft noise [i.e., all census tracts that are crossed or encompassed by the 65 dB DNL noise contour]).

**Table 5-15 Environmental Justice Statistics for NAS Whidbey Island Analysis (2000)**

	<b>Total Population</b>	<b>Percent Minority</b>	<b>Percent Hispanic</b>	<b>Percent Low-Income</b>	<b>Percent Children</b>
State of Washington	5,894,121	18.3	7.5	10.6	25.6
Island County	71,558	12.9	4.1	7.0	25.4
City of Oak Harbor	19,905	26.4 <sup>1</sup>	6.5	9.3	31.6 <sup>1</sup>
Town of Coupeville	1,738	9.9	5.4	11.4 <sup>1</sup>	22.6
City of Anacortes	14,707	7.8	3.0	7.7	23.7

Source: U.S. Census Bureau 2000

Notes:

<sup>1</sup> Higher than the state percentages.

The geographic areas compared in this environmental justice analysis are the town of Coupeville and the city of Oak Harbor in Island County, the city of Anacortes in Skagit County, and the state of Washington. The statistics for these areas are provided in Table 5-15 below. Data from the year 2000 have been used in this analysis because the census tract-level data used in Section 6.5.5 are not available for any year after 2000.

## **5.6 Infrastructure and Utilities**

As noted above in the Introduction to this chapter, these resources would not be affected by the proposed action and so are not discussed in this EIS.

## **5.7 Community Services**

As noted above in the Introduction to this chapter, these resources would not be affected by the proposed action and so are not discussed in this EIS.

## **5.8 Transportation**

As noted above in the Introduction to this chapter, transportation would not be affected by the proposed action and so is not discussed in this EIS.

## **5.9 Topography and Soils**

Whidbey Island lies within the Puget Sound Lowland, a topographic and structural depression between the Olympic Mountains and the Cascade Range. Topography at Ault Field consists mainly of gentle to moderate slopes with elevations ranging from sea level to approximately 220 feet amsl. The developed area of Ault Field, including the airfield and surrounding

facilities, is in a level, low-lying area about 20 to 50 feet amsl. Approximately 515 acres of this area were filled and leveled for construction of the station's taxiways and runways. Steep slopes occur mainly along the station's shoreline. The proposed construction areas at Ault Field range from relatively flat to gently sloped. Elevation in these areas ranges from 10 feet to approximately 50 feet amsl.

Forty-one soil types are mapped within the boundaries of NAS Whidbey Island. Soils mapped by the Natural Resources Conservation Service (NRCS) within proposed Construction Areas Nos. 1 and 3 include Hoypus gravelly loamy sand, Carbondale muck, Semiahmoo muck, and Norma loam. Construction Area No. 2 was previously filled to construct the airfield and support facilities, so natural surface soils do not occur in this area.

Hoypus gravelly loamy sand is one of the most extensive soils on Whidbey Island, occupying moraines and outwash plains. Hoypus soils are characterized as deep and somewhat excessively drained. Carbondale muck consists of well-decomposed woody organic matter and overlying woody and fibrous materials in various stages of decomposition. It occupies depressions left by glacial lakes or occurs along the edges of stream channels or bays. The areas have no natural drainage outlets, so they are generally ponded during part of the year. Semiahmoo muck occupies depressions, basins, or flats where drainage is very poor. Norma loam is a poorly drained soil that occurs in depressions in the glaciated uplands.

## **5.10 Water Resources and Wetlands**

### **5.10.1 Surface Water**

Ault Field is located in the upper Puget Sound basin, at the eastern end of the Strait of Juan de Fuca. Defined by the U.S. Geological Survey (USGS) as a 95-mile-long channel, the Strait of Juan de Fuca is the principal outlet for the Georgia Strait and Puget Sound, connecting both to the Pacific Ocean (U.S. Geological Survey 2007). NAS Whidbey Island includes 15.5 miles of shoreline bordering the inland estuarine waters of Puget Sound. These waters include the Strait of Juan de Fuca, Admiralty Inlet, Oak Harbor, Crescent Harbor, and Saratoga Passage. The eastern end of Ault Field is approximately 2 miles west of Dugualla Bay. This waterbody is on the northeast corner of Whidbey Island and leads into the larger Skagit Bay to the east.

No naturally occurring rivers, streams, lakes, or ponds are present on Ault Field. The original shallow, meandering watercourses that were present on Ault Field have been channelized and straightened into a series of ditches that now comprise the station's storm water conveyance system. These ditches have a total length of approximately 20 miles (EA Engineering, Science, and Technology, Inc. 1996).

A series of maintained drainage ditches bisect the proposed Construction Areas Nos. 1 and 3 at Ault Field. These ditches are generally 2 to 10 feet wide, have steep banks, and maintain water flow throughout most of the year.

### **5.10.2 Water Quality**

The waters along Ault Field are generally clear during calm periods, but turbidity frequently increases temporarily during storms. Water quality in the area of Ault Field is considered good for the eastern Straits of Juan Fuca. According to the 2004 CWA 303d list for Washington State (a list, compiled every two years, of water bodies that do not meet the CWA requirements), no impaired water bodies are listed on or near Ault Field (Washington State Department of Ecology 2006).

Impervious surfaces cover approximately 600 acres (14%) of Ault Field. The Clover Valley watershed drains most of this impervious surface, including the runways, taxiways, hangars, auxiliary buildings, and support roadways. A primary surface drainage system comprising numerous swales and ditches conveys water from Ault Field to Clover Valley stream, which flows east toward the Dugualla Lagoon and Dugualla Bay (see Figure 5-7). The Dugualla Lagoon serves as a detention basin for drainage from approximately 7,000 acres of land drained by the ditch network. Constructed in the 1940s, the lagoon was maintained previously by various government entities.

Dugualla Lagoon provides limited storm water storage and minimal water quality treatment capacity. Water is then discharged from Dugualla Lagoon to Dugualla Bay via a system of pumps. NAS Whidbey Island currently maintains the pumping station that pumps water from the lagoon into Dugualla Bay in order to prevent flooding of Ault Field and nearby land (URS Consultants, Inc. 1995). By controlling this pumping system, the Navy maintains the current water surface elevation in Dugualla Lagoon at the maximum elevation. Prior to installation of this system of pumps, two tidal flumes conveyed flows to Dugualla Bay.

Dugualla Lagoon may provide storm water retention volume until flows are discharged, via a system of pumps, to Dugualla Bay to eliminate exceeding the maximum water surface elevation. The maximum water surface elevation of Dugualla Lagoon was agreed upon in negotiations between the Navy and local landowners. The retention volume of Dugualla Lagoon has been quantified through hydraulic modeling of storm water flows. One ditch, located north of Runway 07/25, empties into the Strait of Juan de Fuca.

NAS Whidbey Island complies with its National Pollutant Discharge Elimination System (NPDES) permit for release of storm water from various industrial facilities located at the station. As part of the permit program, NAS Whidbey Island has prepared a Storm Water Pollution Prevention Plan (SWPPP) to control storm water discharges from the station that may adversely affect the water quality in the Strait of Juan de Fuca and Dugualla Bay. The plan identifies potential sources of storm water contamination and describes the best management practices (BMPs) that are used to prevent or minimize exposing storm water to pollutants. Structural BMPs are used at on-base industrial and process areas such as vehicle or aircraft maintenance, wash-down, and fueling areas; material storage, loading, and unloading areas; and waste disposal areas that are exposed to storm water. Structural BMPs include erosion and sediment controls, berms or dikes around critical areas, retention/detention basins, oil/water separators, and leak detection systems. Non-structural BMPs include preventive maintenance practices, regular inspections, spill prevention and response, procedures and practices for significant materials storage and handling, and regular pavement cleaning to remove oil and grease.

### **5.10.3 Floodplains**

Executive Order 11988, *Floodplain Management*, requires federal agencies to identify and consider practicable alternatives for locating incompatible facilities in areas identified as floodplains. Where practicable alternatives are not available, federal structures and facilities must be constructed in accordance with and be consistent with the intent of the standards and criteria of the National Flood Insurance Program.

Areas within the 100-year floodplain at Ault Field have not been mapped by the Federal Emergency Management Agency (FEMA). Storm-related tidal flooding occasionally occurs east of the runways, next to the eastern boundary of the installation, during winter storms when high winds combine with extreme high tides on Dugualla Bay to bring the tidal surge farther inland

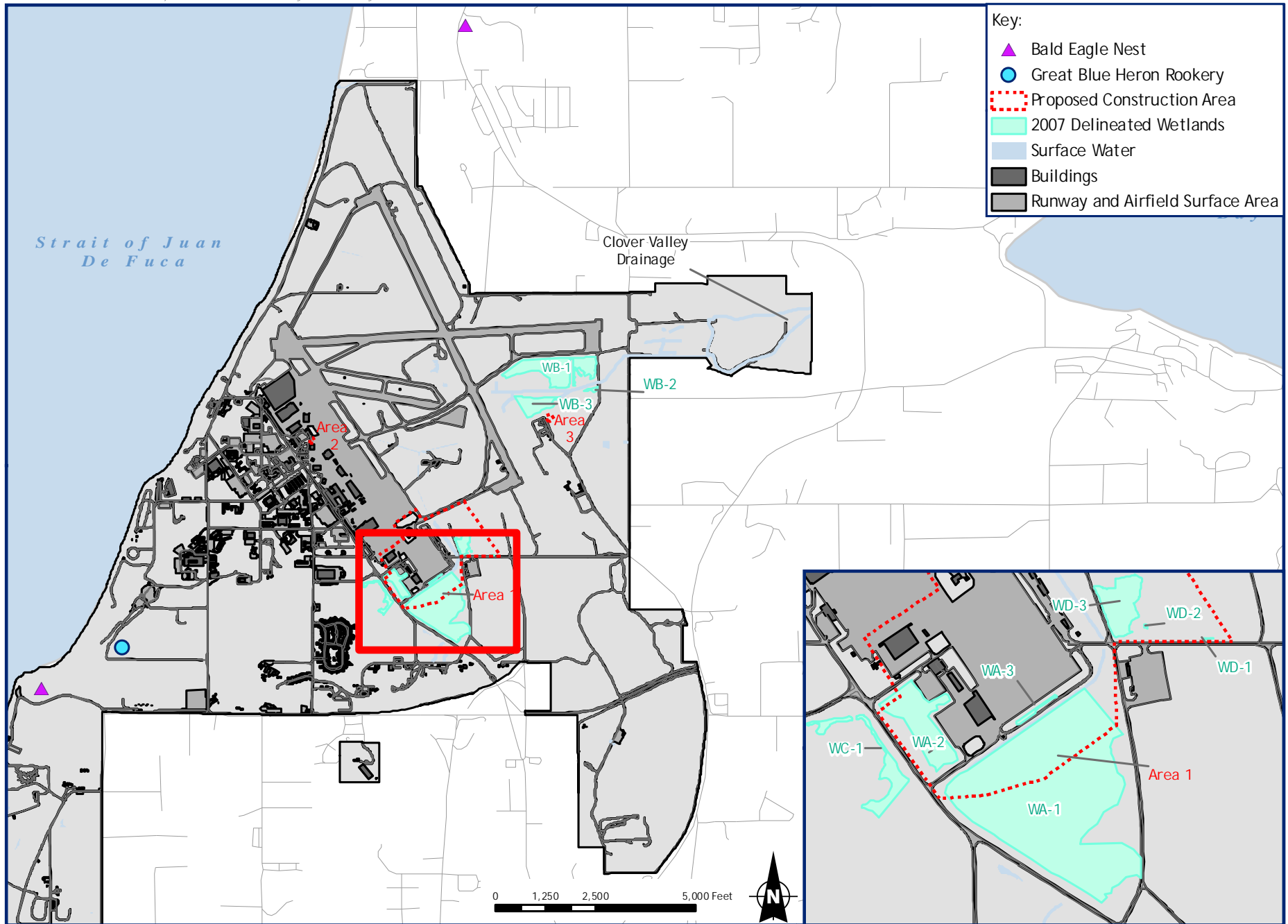


Figure 5-7  
 Natural Resources  
 NAS Whidbey Island, Island County, Washington



than normal (EA Engineering, Science, and Technology, Inc. 1996). The runway ditch network handles storm water drainage for Ault Field and the surrounding area. None of the proposed construction areas at NAS Whidbey Island are prone to flooding from storm water flow through the airfield ditch system.

#### **5.10.4 Groundwater**

Groundwater beneath NAS Whidbey Island is present in three main aquifer systems: the shallow, intermediate, and deep aquifers. The aquifers are composed of sand or sand and gravel with confining layers of till, clay, and silt. The shallow aquifer is a major water-bearing zone on Whidbey Island and generally ranges in depth from 20 to 145 feet below ground surface (bgs); the intermediate aquifer extends throughout the northern portion of Whidbey Island, and water levels are generally 5 to 20 feet beneath the shallow aquifer; the deep aquifer (or sea level aquifer) is a continuous water-bearing zone on Whidbey Island, with water levels ranging from 11 to 17 feet above sea level (Simonds 2002).

The EPA has designated the Whidbey Island aquifer system as a sole-source aquifer: it is the only supply of potable water for at least half of the residents. There is no viable alternative source of drinking water for those using groundwater, and the aquifer boundaries have been defined (URS Consultants, Inc. 2002).

Water-level data from environmental investigations at NAS Whidbey Island and regional studies indicate that groundwater flow at Ault Field generally follows surface topography. Most of the groundwater underlying Ault Field converges in the central runway areas and likely discharges eastward to Dugualla Bay. Groundwater along the western side of Ault Field appears to discharge westward to the Strait of Juan de Fuca (EA Engineering, Science, and Technology, Inc. 1996).

NAS Whidbey Island does not use groundwater as a source of drinking water. Rather, treated surface water is piped to the installation from the Skagit River. The city of Oak Harbor uses the Skagit River for 75% of its drinking water, with the remaining 25% supplied by three municipal wells. Island County residents near Ault Field not located within the Oak Harbor water district use private wells for drinking water.

There is contaminated groundwater beneath Ault Field from a former landfill located in the southeastern portion of the installation. In the mid-1990s, the contaminated groundwater was

found to be migrating off-site towards private water supply wells. In response, the Navy designed an extraction and treatment system to control the migration of contaminated groundwater. All private wells in the vicinity of the contaminant plume were closed and the residences were connected to public water supplies (Agency for Toxic Substances and Disease Registry September 28, 1993). Groundwater beneath any of the proposed construction areas at Ault Field is not known to be contaminated.

#### **5.10.5 Wetlands**

More than 500 acres of wetlands are located on Ault Field. Figure 5-7 identifies delineated wetland locations within the installation. Wetlands on Ault Field are most concentrated in the flat, low-lying areas near the center of the installation. Freshwater marshes and wet meadows are the most common wetland communities occurring at Ault Field.

The Navy completed a wetland delineation of the proposed construction areas at Ault Field in June, October, and November 2007 (Ecology and Environment, Inc. 2007). Wetlands were delineated in accordance with the *1987 U.S. Army Corps of Engineers Wetland Delineation Manual* (Environmental Laboratory 1987) and the *Washington State Wetlands Identification and Delineation Manual* (Washington State Department of Ecology 1997). A wetland rating, using the *Western Washington Wetland Rating System* (Washington State Department of Ecology 2004), was also conducted for each delineated wetland.

Approximately 70.87 acres of wetland habitat were delineated within or immediately adjacent to Construction Areas Nos.1 and 3; no wetlands are located in Construction Area No. 2 (see Figure 5-7). The wetlands were identified as WA-1, WA-2, WA-3, WB-1, WB-2, WB-3, WC-1, WD-1, WD-2, and WD-3. Wetlands WA-1 and WA-2 (Construction Area No.1) are south and southeast of the flight line and east of Charles Porter Avenue; WA-3 is located in the secure boundaries of the airfield at the south end, to the northwest of WA-1. These wetlands are surrounded by the air station's infrastructure. Wetlands WB-1, WB-2, and WB-3 (Construction Area No. 3) are located east of 14/32 and south of Taxiway 'C'. Wetland WC-1 is located southwest of the flight line, west of Charles Porter Avenue, and south of Prowler Avenue. Wetlands WD-1, WD-2, and WD-3 (Construction Area No.1) are located east of the ramp, south of Taxiway 'D' and north of Torpedo Road. Each of these wetlands is described in further detail below.

- **Wetland WA-1** is a palustrine emergent wetland located south of the flight line and is bordered by the flight line, Charles Porter Avenue, and Kitty Hawk Road. This wetland community is approximately 32.25 acres and is dominated by reed canarygrass (*Phalaris arundinacea*), with traces of stinging nettle (*Urtica dioica*) and soft rush (*Juncus effusus*). However, there is a stand of Pacific willow (*Salix lasiandra*) and Sitka willow (*Salix sitchensis*) in the center of this wetland. A drainage ditch with standing water bisects the center of this wetland. This drainage ditch connects to a large, maintained ditch at the north end of WA-1. Potential functions of this wetland include wildlife habitat, flood-flow alteration, sediment/toxicant retention and removal, and transformation of nutrients and sediments.
- **Wetland WA-2** is a palustrine emergent wetland located immediately northwest of wetland WA-1, between Charles Porter Avenue, Randolph Road, Prowler Street, and the flight line. This depressional wetland is approximately 4.28 acres and is dominated by reed canarygrass. Potential functions of this wetland include wildlife habitat, flood-flow alteration, transformation of nutrients and sediments, and sediment/toxicant retention and removal.
- **Wetland WA-3** is a palustrine emergent wetland located in the secure boundaries of the airfield at the south end, to the northwest of WA-1. This depressional wetland is approximately 0.18 acres in size and dominated by reed canarygrass. Potential functions of this wetland include flood-flow alteration, transformation of nutrients and sediments, and sediment/toxicant retention and removal.
- **Wetland WB-1** is a palustrine scrub-shrub/emergent wetland located to the south of the Taxiway 'C' and east of Runway 14/32 in the northeast corner of the Ault Field Base. The wetland is approximately 21.41 acres. This wetland is dominated by reed canarygrass, stinging nettle, soft rush, Baltic rush (*Juncus balticus*), and Scouler's willow (*Salix scouleriana*). A regularly maintained drainage ditch bisects this wetland, with cattail (*Typha latifolia*) and field horsetail (*Equisetum arvense*) observed at the northeast end of this ditch. Spoils from ditch maintenance activities have been placed immediately adjacent to the ditch. Potential functions for this wetland include wildlife habitat, flood-flow alteration, minimal sediment stabilization, and removal/transformation of nutrients and sediments.
- **Wetland WB-2** is a palustrine emergent wetland located west of Intrepid Road, south of wetland WB-1. This wetland is approximately 0.49 acres in size and is dominated by Baltic rush, common velvet grass (*Holcus lanatus*), stinging nettle, and reed canarygrass. Potential functions of this wetland include sediment/toxicant retention and removal, flood-flow alteration, and transformation of nutrients and sediments.
- **Wetland WB-3** is a palustrine emergent wetland located along the west side of the proposed impact area, immediately north of the high explosive magazine building. This wetland is approximately 6.13 acres in size and is dominated by reed canarygrass, with traces of stinging nettle. Black twinberry (*Lonicera involucrata*) and Pacific willow were also observed along the perimeter of the wetland. A regularly maintained drainage ditch bisects this wetland, with spoils from ditch maintenance activities placed immediately adjacent to the drainage ditch. Potential functions of

this wetland include wildlife habitat, flood-flow alteration, minimal sediment stabilization, sediment/toxicant retention and removal, and transformation of nutrients and sediments.

- **Wetland WC-1** is a palustrine emergent wetland located at the base of the upland embankment along Charles Porter Avenue, south side of Prowler Avenue. This wetland community is approximately 2.10 acres in size and is dominated by reed canarygrass and soft rush, with some cattails and traces of thistle (*Cirsium arvense*) and duckweed (*Lemna minor*). Areas of standing water, up to a depth of approximately 6 inches, occur at the toe-of-slope along Charles Porter Avenue and Prowler Avenue. The western edge of WC-1 terminates in a drainage swale, approximately 4 feet wide. This swale flows in a southerly direction through an open area located to the east of a residential area adjacent to Langley Boulevard. Potential functions of this wetland include wildlife habitat, flood-flow alteration, minimal sediment stabilization, sediment/toxicant retention and removal, and transformation of nutrients and sediments.
- **Wetland WD-1** is a palustrine emergent wetland located east of the ramp south of the Taxiway 'D' existing parking apron and north of Torpedo Road. This wetland community is approximately 0.01 acres in size and is dominated by reed canarygrass. Potential functions of this wetland include flood-flow alteration, minimal sediment stabilization, sediment/toxicant retention and removal, and transformation of nutrients and sediments.
- **Wetland WD-2** is a palustrine emergent wetland located east of the ramp south of Taxiway 'D' and north of Torpedo Road. This wetland community is approximately 0.01 acres in size and is dominated by reed canarygrass. Potential functions of this wetland include flood-flow alteration, minimal sediment stabilization, sediment/toxicant retention and removal, and transformation of nutrients and sediments.
- **Wetland WD-3** is a palustrine emergent wetland located east of the ramp south of Taxiway 'D' and north of Torpedo Road. This wetland community is approximately 2.79 acres in size and is dominated by reed canarygrass. Potential functions of this wetland include minimal wildlife habitat, flood-flow alteration, minimal sediment stabilization, sediment/toxicant retention and removal, and transformation of nutrients and sediments.

The Navy met with the U.S. Army Corps of Engineers (USACE) at NAS Whidbey Island on November 20, 2007 for a jurisdictional determination (JD) of the boundaries of the wetlands delineated in June and October. The JD is the process of identifying and locating jurisdictional waters of the United States (including wetlands) regulated by the USACE under Section 404 of the CWA and establishes the line that separates and identifies the USACE-regulated wetland areas from non-wetland (upland) areas that are not regulated by the USACE. At the November 20 meeting, the USACE concurred with the delineation boundaries identified by the Navy. Three additional wetlands (wetlands D-1, D-2, and D-3) were delineated in November and findings

were sent to the USACE. The USACE concurred with the delineations of all four wetland series and issued their JD on April 9, 2008.

## **5.11 Biological Resources**

### **5.11.1 Vegetation**

Vegetation communities cover approximately 76% of Ault Field. Grasslands are the dominant vegetation community, covering 1,956 acres (46%) of the total land area. The grasslands comprise open fields and agricultural lease areas and include native and exotic grasses, grains, and annual crops. Other vegetation communities at Ault Field include a variety of upland forested, wetland, and marine habitats. These communities are most concentrated around the periphery of Ault Field, away from the airfield and adjacent development.

The three proposed construction areas at Ault Field include a mixture of developed areas and herbaceous and forested vegetation. Vegetation in Construction Area No. 1 is predominantly wet meadow wetland (see Section 5.10.5 for additional discussion on wetland communities in the proposed construction areas). A small portion of this construction area also includes maintained grassland habitat. With the exception of a small amount of landscaped area, the entire Construction Area No. 2 has been developed within the airfield infrastructure. Construction Area No. 3 includes maintained grassland, wet meadow wetland, and mixed forest vegetation communities. Plant species present in each of the grassland communities include a variety of grasses, rushes, sedges, and herbs, with scattered small shrubs also present.

### **5.11.2 Wildlife**

Grasslands have little structural diversity and provide a low number of habitat niches for relatively few wildlife species, so the grasslands and wet meadow wetland habitats that dominate the proposed construction areas at Ault Field do not support a diverse or abundant wildlife population. Similarly, the wet meadows lack structural diversity and the hydrologic regime to provide surface water year-round and thus attract fewer species than more complex wetland systems with deeper marsh and open water components. Wildlife that would be present in these habitats includes migratory waterfowl, neotropical migratory songbirds and raptors, small burrowing mammals, and reptiles. Northern harrier (*Circus cyaneus*) are known to nest in undisturbed grass-

lands near the runway (EA Engineering, Science, and Technology, Inc. 1996). Other species observed in these habitats during field surveys included great blue heron (*Ardea herodias*) and black-tailed deer (*Odocoileus hemionus columbianus*) (Ecology and Environment, Inc. 2007).

The highest diversity of wildlife species at Ault Field occurs in the southwest portion of the installation in the vicinity of Rocky Point. Species diversity is highest in this area due to the number and contiguity of habitat types, including stands of mature forest, coastal bluffs, beach strand, native dune vegetation, and a large freshwater wetland. The freshwater wetland has been identified by the Washington Department of Natural Resources (WDNR) as a significant habitat for neotropical migratory birds.

Several small and two relatively large forest blocks are scattered throughout Ault Field. Common wildlife using the forested habitat include black-tailed deer, cottontail rabbit (*Sylvilagus floridanus*), raccoon (*Procyon lotor*), coyote (*Canis latrans*), garter snake (*Thamnophis* spp.), salamanders (*Ambystoma* spp.), frogs (*Rana* spp.), and numerous species of birds. Marine habitats are located along and adjacent to the western boundary of Ault Field and comprise intertidal and subtidal areas. Numerous marine fishes, terrestrial and aquatic mammals, and invertebrates occur on beaches and in adjacent waters associated with these habitats. Cormorants (*Phalacrocorax* sp.), loons (*Gavia* sp.), grebes (*Podiceps* sp.), and various species of diving ducks also are common year-round and/or are seasonal residents of the marine habitats (EA Engineering, Science, and Technology, Inc. 1996). There is no access to freshwater spawning and rearing habitats along the shores of Ault Field for anadromous species (Miller January 2007).

The riparian habitat along the runway ditches and Clover Valley Lagoon provides nesting for many bird species, including ducks, rails, coots, blackbirds, and kingfishers. Amphibians that live in the aquatic and riparian habitat of the runway ditches and lagoon include frogs and salamanders. Clover Valley stream, which has been straightened and channelized on the base but transitions to a natural feature east of the installation, is listed by the Washington Department of Fish and Wildlife (WDFW) as a priority resident fish presence for resident cutthroat (*Onchorhynchus clarki*) (Guggenmos May 29, 2007). Farther east, Dugualla Bay is home to the many species of flora and fauna that are typical in other inlets in Puget Sound.

### **5.11.2.1 Migratory Birds**

The Migratory Bird Treaty Act (MBTA) is the primary legislation in the United States established to conserve migratory birds. The MBTA prohibits taking, killing, or possessing migratory birds unless permitted by regulation. Under 50 CFR Part 21, the Armed Forces are authorized to take migratory birds during military readiness activities; however, the Armed Forces must confer and cooperate with the U.S. Fish and Wildlife Service (USFWS) on the development and implementation of conservation measures to minimize or mitigate adverse effects of military readiness activities if it determines that such activities may have a significant adverse effect on a population of migratory birds. Congress defined military readiness as all training and operations of the Armed Forces that relate to combat and the adequate and realistic testing of military equipment, vehicles, weapons, and sensors for proper operation and suitability for combat use. An activity has a significant adverse effect if, over a reasonable period of time, it diminishes the capacity of a population of a migratory bird species to maintain genetic diversity, to reproduce, and to function effectively in its native ecosystem.

Military readiness activities do not include operation and maintenance of the aircraft at the airfield or construction of support infrastructure. These operations are considered non-military readiness activities. Migratory bird conservation relative to non-military readiness activities is addressed separately in a Memorandum of Understanding (MOU) developed in accordance with Executive Order 13186, signed January 10, 2001, “*Responsibilities of Federal Agencies to Protect Migratory Birds*.” The MOU, between the DoD and the USFWS, outlines the responsibility of federal agencies to protect migratory birds and how to incorporate conservation efforts into their routine operations and construction activities.

A point-count monitoring program for neotropical migratory songbirds was initiated at NAS Whidbey Island in 1994 by the Navy in cooperation with the Student Conservation Association. These counts are repeated every five years. The most frequently observed neotropical migratory songbirds at the station include the American robin, savannah sparrow, song sparrow, marsh wren, American goldfinch, bushtit, rufous hummingbird, European starling, common crow, chestnut-backed chickadee, golden-crowned kinglet, Swainson’s thrush, red-winged blackbird, common yellowthroat, and house finch (EA Engineering, Science, and Technology, Inc. 1996; USDA Forest Service 2002).

#### **5.11.2.2 Bird-Aircraft Strike Hazards**

The presence of resident and migratory birds creates a bird-aircraft strike hazard (BASH) risk at NAS Whidbey Island. The greatest risk occurs at Ault Field due to the presence of water-filled ditches, freshwater wetlands, marine shoreline, perch sites, tall brush, and short grass in the vicinity of the runways, all of which attract numerous bird species. NAS Whidbey Island has prepared a BASH plan to reduce the potential for collisions between aircraft and birds or other animals. The BASH plan prescribes an ongoing process that involves the distribution of information and active and passive measures to control how birds use the critical areas around the airfield. Methods outlined in the plan to reduce bird-aircraft strike hazards at Ault Field include habitat management, bird dispersal and depredation, and bird avoidance (U.S. Department of the Navy December 4, 2001).

In addition, aircrews are trained to be aware of indications of BASH potential and in procedures to avoid potential BASH incidents. The BASH plan also includes an outline of emergency actions following a bird-aircraft strike incident and the post-flight follow-up and reporting procedures.

#### **5.11.3 Threatened and Endangered Species**

The Endangered Species Act (ESA) of 1973 and subsequent amendments provide for the conservation of threatened and endangered species of animals and plants and the habitats in which they are found. The Navy ensures consultations are conducted as required under Section 7 of the ESA for any action that “may affect” a federally listed threatened or endangered species. Although protection of species listed at the state level as threatened or endangered is not legally mandated for federal agencies, the Navy encourages cooperation with states to protect such species where such protection is consistent with an installation’s mission.

The USFWS Western Washington Fish and Wildlife Office, the National Oceanic and Atmospheric Administration (NOAA) Fisheries, and the WDFW were contacted to obtain updated information on protected species on and in the vicinity of NAS Whidbey Island. Each of these agencies maintain databases to track the occurrence of threatened and endangered species: the USFWS provides species occurrences on a county level (U.S. Fish and Wildlife Service December 20, 2005); NOAA Fisheries provides species occurrences by marine and estuarine waterbody (National Oceanic and Atmospheric Administration National Marine Fisheries Service



2007); and the WDFW provided site-specific reports of species occurrences (Guggenmos May 29, 2007).

Recent agency consultation and a review of agency websites indicates federally listed threatened and endangered species that may occur within or in the vicinity of Ault Field and adjacent waters are the steller sea lion (*Eumetopias jubatus*), humpback whale (*Megatera novaengliae*), southern resident killer whale (*Orcinus orca*), marbled murrelet (*Brachyramphus marmoratus*), leatherback sea turtle (*Dermochelys coriacea*), Puget Sound chinook salmon (*Oncorhynchus tshawytscha*), Puget Sound steelhead (*Oncorhynchus mykiss*), Coastal Washington-Puget Sound bull trout (*Salvelinus confluentus*), and golden Indian paintbrush (*Castilleja levisecta*). The current federal protection status of each of these species is indicated in Table 5-16.

**Table 5-16 Federally Protected Species and Species of Concern that May Occur at or in the Vicinity of NAS Whidbey Island**

Category	Species		Status	
	Common Name	Scientific Name	Federal	State
<b>Federal Threatened and Endangered Species</b>				
Mammals	Steller sea lion	<i>Eumetopias jubatus</i>	T; MMPA	T
	Humpback whale	<i>Megatera novaengliae</i>	E; MMPA	E
	Southern resident killer whale	<i>Orcinus orca</i>	E; MMPA	E
Birds	Marbled murrelet	<i>Brachyramphus marmoratus</i>	T	T
Reptiles	Leatherback sea turtle	<i>Dermochelys coriacea</i>	E	E
Fish	Puget Sound chinook salmon	<i>Oncorhynchus tshawytscha</i>	T	SC
	Puget Sound Steelhead	<i>Oncorhynchus mykiss</i>	T	—
	Washington-Puget Sound bull trout	<i>Salvelinus confluentus</i>	T	SC
	Coho salmon	<i>Oncorhynchus kisutch</i>	FSC	
Plants	Golden Indian paintbrush	<i>Castilleja levisecta</i>	T	
<b>Other Species of Concern<sup>1</sup></b>				
Mammals	Long-legged myotis	<i>Myotis volans</i>	FSC	SM
	Long-eared myotis	<i>Myotis evotis</i>	FSC	SM
	Northern sea otter	<i>Enhydra lutris kenyoni</i>	MMPA	SC
	California sea lion		MMPA	—
	Harbor seal		MMPA	SM
Birds	Olive-sided flycatcher	<i>Contopus cooperi</i>	FSC	—
	Peregrine falcon	<i>Falco peregrinus</i>	FSC	SS
	Northern goshawk	<i>Accipiter gentilis</i>	FSC	SC
	Bald eagle	<i>Haliaeetus leucocephalus</i>	BGEPA	T

**Table 5-16 Federally Protected Species and Species of Concern that May Occur at or in the Vicinity of NAS Whidbey Island (continued)**

Category	Species Common Name	Species Scientific Name	Status	
			Federal	State
Amphibians	Western toad	<i>Bufo boreas</i>	FSC	SC
Insects	Taylor's (whulge) checkerspot	<i>Euphydryas editha taylori</i>	C	E

Sources: National Oceanic and Atmospheric Administration National Marine Fisheries Service 2007; Guggenmos May 29, 2007; U.S. Fish and Wildlife Service December 20, 2005

Note:

<sup>1</sup> These species are not protected under federal law.

Key:

E = Endangered.

T = Threatened.

MMPA = Marine Mammal Protection Act.

BGEPA = Bald and Golden Eagle Protection Act.

C = Candidate.

FSC = Federal Species of Concern.

SC = State Candidate Species.

SM = State Monitor Species.

SS = State Sensitive Species.

#### **5.11.3.1 Steller Sea Lion**

Steller sea lions (*Eumetopias jubatus*) occur in the inland marine waters of Washington and have occasionally been observed in Saratoga Passage on the east side of Whidbey Island. In Washington, Steller sea lion numbers vary seasonally, with peak counts of 1,000 animals present during the fall and winter months. Haul out, or rest sites, used by this species include offshore rocks, coastal islands, and docks (Washington Department of Fish and Wildlife February 2000). There are no Steller sea lion rookeries in the state of Washington and no Steller sea lion haul-out sites have been recorded on Whidbey Island (Miller 2007; Washington Department of Fish and Wildlife February 2000). In addition, no critical habitat for this species has been designated in the vicinity of Ault Field.

#### **5.11.3.2 Humpback Whale**

Humpback whales (*Megaptera novaengliae*) are present off the Washington coast during winter. They are known to be present in the Strait of Juan de Fuca in low numbers. Historically, humpbacks used the inland waters of Puget Sound, but they are now considered only rare visitors (Miller January 2007). Critical habitat for the humpback whale has not been designated.

#### **5.11.3.3 Southern Resident Killer Whale**

Southern resident killer whales (*Orcinus orca*) are present in Puget Sound for several months during the summer and fall each year. The population is composed of three family groups of whales that have been named J, K, and L pods (National Oceanic and Atmospheric Administration, National Marine Fisheries Service 2006). This species has been observed on numerous occasions in the Straits of Juan de Fuca (Miller January 2007). Critical habitat has been designated for the Southern resident killer whale, effective December 29, 2006. However, this designation excludes waters within the boundaries of DoD-managed lands and waters in the Pacific Northwest (National Marine Fisheries Service, Northwest Region October 2006).

#### **5.11.3.4 Marbled Murrelet**

The marbled murrelet (*Brachyramphus marmoratus*) is a small seabird that nests in large trees in coniferous forests near coastal areas. Only small patches of this type of habitat occur on Whidbey Island, none of which have previously been identified as supporting marbled murrelet nesting activity (EA Engineering, Science, and Technology, Inc. 1996). In addition, no marbled murrelet occupancy sites are currently known to be present in the vicinity of Ault Field, according to recent data obtained from the WDFW (Guggenmos May 29, 2007). This species forages in the inshore marine environment and likely uses waters offshore of Ault Field when food sources are available (Miller January 2007). Critical habitat for marbled murrelet has been designated on approximately 1.5 million acres in Washington State; however, no lands on or near Ault Field are designated as critical habitat.

#### **5.11.3.5 Leatherback Sea Turtle**

Leatherback sea turtles (*Dermochelys coriacea*) occur seasonally off the Washington coast and are occasionally seen foraging in the Strait of Juan de Fuca (Tsao et al. 2005). The inland waters of Puget Sound provide limited forage or other habitat for this species; therefore, leatherback sea turtles are not likely to be present within the marine waters near Ault Field. Critical habitat for leatherback sea turtles has not been designated.

#### **5.11.3.6 Puget Sound Chinook Salmon, Puget Sound Steelhead, Coastal Washington-Puget Sound Bull Trout, and Coho Salmon**

Three primary estuarine rearing areas for Puget Sound chinook salmon, Puget Sound steelhead, and coho salmon are located east of Whidbey Island and are associated with the Skagit, Stillaguamish, and the Snohomish Rivers. Puget Sound chinook salmon, Puget Sound steelhead, and coho salmon are known to migrate along the western shores of Whidbey Island and so would be present in the marine waters adjacent to Ault Field. Coastal Washington-Puget Sound bull trout are thought to be rare visitors to the shorelines of western Whidbey Island (Miller January 2007). No critical habitat for these species has been designated along the western shoreline of Whidbey Island in the vicinity of Ault Field.

#### **5.11.3.7 Golden Indian Paintbrush**

Golden Indian paintbrush occurs in native open grasslands. Many of the sites where this species has been documented as occurring are generally flat and at elevations below 330 feet. These sites are also typically moist in the winter but not inundated with water (Center for Plant Conservation n.d.).

One population of golden Indian paintbrush is known to occur at NAS Whidbey Island on Seaplane Base. The WDNR completed a threatened and endangered plant survey at NAS Whidbey Island in 1994 and 1995 but did not identify any populations or individual occurrences of the species at Ault Field (EA Engineering, Science, and Technology, Inc. 1996). Recent correspondence with the WDNR does not indicate any recent observations of this species on or in the immediate vicinity of the installation (Guggenmos May 29, 2007). Furthermore, most of the proposed construction area at Ault Field is wet meadow wetland characterized by saturated soils and surface inundation for long periods during the year. This habitat is not suitable for the establishment of golden Indian paintbrush communities.

#### **5.11.3.8 Other Species of Concern**

Other species of concern on or in the vicinity of Ault Field include the bald eagle, long-legged myotis, long-eared myotis, olive-sided flycatcher, peregrine falcon, northern goshawk, western toad, and Taylor's checkerspot. The current protection status of these species is indicated in Table 5-16.

Because of its reproductive success throughout the U.S., the bald eagle (*Haliaeetus leucocephalus*) has been delisted, effective August 8, 2007. However, taking of bald eagles is still prohibited under the BGEPA and the MBTA. Bald eagles are often observed along NAS Whidbey Island's shoreline perched in trees on the top of shoreline bluffs. Two bald eagle nests are located on or immediately adjacent to Ault Field: one is located in the southwest portion of the installation along the coastline at Rocky Point; the other nest is located adjacent to the northern boundary of Ault Field near two small ponds and a pasture (Guggenmos May 29, 2007). A study completed in 1996 (EDAW, Inc. 1996) found that eagles use most of the Ault Field shoreline bordering the Strait of Juan de Fuca. Five areas of concentrated bald eagle use were identified at Ault Field: the area immediately surrounding Rocky Point; the point north of Cliffside Park; the one mile of shoreline along Nortz Road; the pilings/approach lights on and just offshore of the approach (northwest) end of Runway 14; and the area along the northern boundary of Ault Field near the North Gate. None of the proposed construction areas at Ault Field are located within these bald eagle concentration areas.

Taylor's checkerspot, a federal candidate species, is known to occur in only four populations, three in Washington, and one in Oregon. This butterfly species inhabits open grasslands and oak stands (The Butterfly Conservation Initiative 2006). Recent agency correspondence indicates no populations of Taylor's checkerspot were identified on Whidbey Island in the vicinity of Ault Field (Guggenmos May 29, 2007).

The long-eared myotis and long-legged myotis are bat species that favor wooded areas, primarily coniferous or mixed coniferous and deciduous forests near rocky bluffs or canyons. At Ault Field, these species would most likely be found in the forested areas near Rocky Point. These species may also forage in the landscaped areas of the installation.

The olive-sided flycatcher is a year-round resident at Ault Field. This species would be present in the larger tracts of forestland on the installation (EA Engineering, Science, and Technology, Inc. 1996).

The peregrine falcon and northern goshawk are uncommon species in the vicinity of Ault Field. If present at the installation, both species would likely be transient visitors only.

The western toad could potentially be present in a variety of habitats at Ault Field, including forestlands, scrub-shrub lands, and emergent wetlands (EA Engineering, Science, and Technology, Inc. 1996).

#### **5.11.4 Marine Mammals**

The Marine Mammal Protection Act is administered by the USFWS and NOAA Fisheries to protect and manage marine mammals. The protection of coastal marine mammal species such as the harbor seal is under the jurisdiction of the USFWS. Common marine mammal species protected under the MMPA known to occur in the upper Puget Sound basin include the humpback whale, killer whale, California sea lion, harbor seal, and northern sea otter. As discussed above, humpback and killer whales have been observed in the Strait of Juan de Fuca. The California sea lion, harbor seal, and northern sea otter feed in the waters near Ault Field and use beaches and rocks on the station as haul out sites (EA Engineering, Science, and Technology, Inc.). The recorded harbor seal haul out site closest to Ault Field is located near Oak Harbor, approximately 4 miles southeast of the installation (Washington Department of Fish and Wildlife February 2000). A group of California sea lion haul out sites is located in the southern end of Whidbey Island, more than 20 miles south of Ault Field (Washington Department of Fish and Wildlife February 2000).

#### **5.12 Cultural Resources**

The 1966 National Historic Preservation Act (Public Law 89-665, as amended by Public Law 96-515; 16 U.S.C. 470 et seq.) establishes the National Register of Historic Places (NRHP), which includes historic properties such as districts, sites, buildings, structures, and objects that are significant in American history, architecture, archaeology, and culture. Section 106 of the NHPA requires that federal agencies with jurisdiction over a proposed federal project take into account the effect of actions on cultural resources listed, or eligible for listing, on the NRHP, and affords the State Historic Preservation Office (SHPO) and the Advisory Council on Historic Preservation (ACHP) an opportunity to comment with regard to an undertaking. The NRHP eligibility criteria are defined by the Secretary of the Interior's Standards for Evaluation (36 CFR 60).

A National Register resource is a building, structure, site, district, or object that is included in or eligible for inclusion in the NRHP. Properties that qualify for the NRHP must generally be at least 50 years old; possess integrity of location, design, setting, materials, workmanship, feeling, and association; and meet one or more of the following criteria:

- **Criterion A.** Properties associated with events that have made a significant contribution to the broad patterns of our history;
- **Criterion B.** Properties associated with the lives of persons significant in our past;
- **Criterion C.** Properties that embody the distinctive characteristics of a type, period, or method of construction; or
- **Criterion D.** Properties that have yielded, or may be likely to yield, information important in prehistory or history (36 CFR 60.4).

The Navy has conducted inventories of cultural resources at NAS Whidbey Island to identify historical properties within Ault Field that are listed or potentially eligible for listing in the NRHP (Dames & Moore 1994; Historical Research Associates, Inc. 1997; EDAW, Inc. 2002).

#### **5.12.1 Architectural Resources**

Ault Field as a whole is not eligible as a National Register historic district because many new buildings have been constructed over the years and many other buildings have been altered or removed (Dames & Moore 1994). However, based on the results of a historic building survey, the following four individual buildings at Ault Field are considered potentially eligible for listing on the NRHP:

- **Building 112 (Hangar 1).** Hangar 1 is the only remaining hangar of four structures of its type constructed at the beginning of World War II. This hangar was instrumental in training aerial patrols and crews during the war. Associated with it are two adjacent “Ready Lockers,” Buildings 457 and 458. These structures have been used to store munitions. Hangar 1 has undergone minor alterations but has retained its integrity. This structure and associated Buildings 457 and 458 are eligible for NRHP listing under Criterion A, based on their association with Naval aviation during World War II, and under Criterion C as a distinctive example of a military structure quickly erected to fulfill war needs.
- **Building 118 (Theater).** This building, which has surviving Art Moderne architectural details, served as the base theater. It played an important role in the social life of the base, helping to maintain the morale of the military personnel deployed away from home during wartime. Live shows and theatrical performances were staged

here, and it also served as the movie theater. This building is eligible for listing in the NRHP under Criterion A.

- **Buildings 180 and 220.** Built during World War II, these two structures housed Navy planetariums and were used for training Navy fliers in celestial navigation. While this form of orienteering is very ancient, it was still used for training during World War II to compensate for the possible failure of navigation instruments. These buildings are eligible for listing in the NRHP under Criterion A, based on their historical connection to flight training at Ault Field during World War II. Their design is possibly unique in Washington State and is directly related to their celestial navigation function. Consequently, they also are eligible for listing in the NRHP under Criterion C.
- **Building 386 (Hangar 5).** The main portion of Hangar 5 was built directly as a result of a need for all-weather approaches in the new jet age. The facility played a relatively ancillary and somewhat disparate role in the major thrust of military actions during the Korean conflict and the Cold War. Hangar 5 was used to maintain aircraft and train personnel during the period. The most significant feature of Hangar 5 is its precast concrete arches and roof. Hangar 5 is the only known concrete Miramar style hangar in Washington State. This building is eligible for listing in the NRHP under Criterion C.

### **5.12.2 Archaeological Resources**

No known archaeological sites are located within Ault Field (EDAW, Inc. 2002). However, portions of Ault Field have been identified as archaeologically sensitive areas or as places with a moderate to high probability of containing cultural deposits (see Figure 5-8). These areas include the northern and southern end of the Ault Field shoreline; the eastern end of Clover Valley; the upper end of Dugualla Slough; and an unnamed marsh in the eastern end of the airfield. The potential for these areas to contain archaeological materials is based on location (e.g., proximity to fresh water, food, or technological resources and correlations of site location patterns in the region), known native use in the vicinity, and landform (e.g., stable areas not subject to erosion).

As shown on Figure 5-8, proposed construction areas at Ault Field are located less than 2,500 feet from archaeologically sensitive areas.

From September through November 2007, the Navy conducted an intensive archaeological survey of the proposed impact areas and proposed wetland mitigation area at Crescent Harbor. Survey methods included an intensive pedestrian survey of all areas combined with systematic shovel testing.



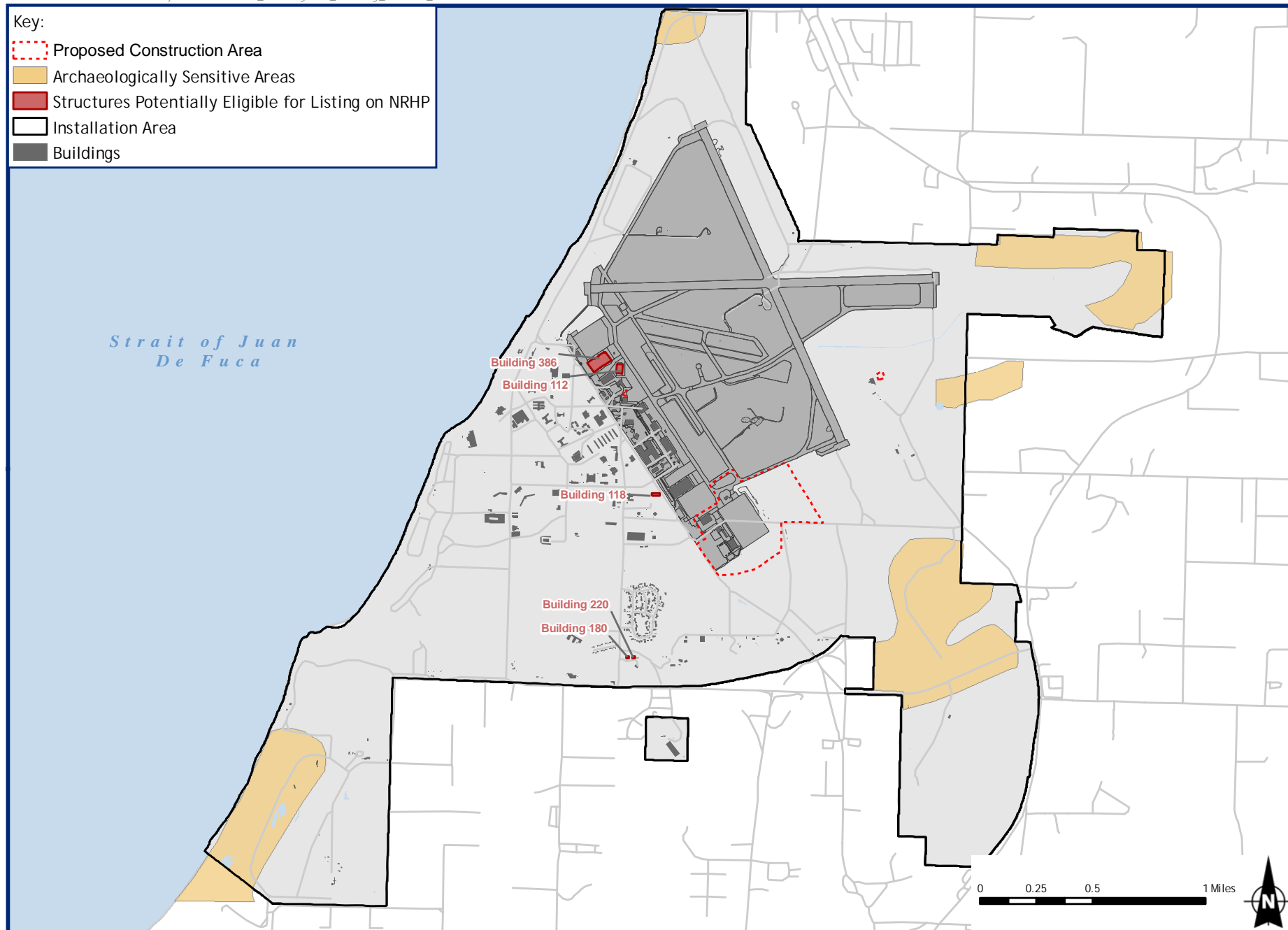


Figure 5-8  
Archaeologically Sensitive Areas  
NAS Whidbey Island, Washington

Of the four proposed impact areas surveyed, archaeological resources were detected in an approximately 160-acre area located west of Hoffman Road and east of the Ammunition Storage Area in Construction Area No. 3 Area in Construction Area No. 3 (see Section 2, Proposed Action and Alternative, Figure 2-9). The area is composed of a level field of bunch grasses (approximately 30 acres), a dense stand of trees to the south (23 acres), and wetlands (approximately 107 acres [the wetland 'B' series described above]) bisected by a large ditch and gravel roadway in the northern portion of the area.

A shallow shell scatter, measuring 722 feet by 82 feet, was found in the grassy field adjacent to the Ammunition Storage gravel road. The shell was highly fragmented and found in the upper 4 inches of the topsoil. No other artifacts were found in association with the shell, and its distribution parallel to the road indicates that it was re-deposited.

A small wooded section located at the southern edge of this 160-acre area appears to be a historic logging site with a dugout area, several push piles, cut tree stumps, and evidence of an old road. This area contained large cedars and Douglas fir trees. The size of the trees indicates the considerable age of this site. No cultural material was found; however, surface visibility was poor.

The 662-acre mitigation study area located south of Crescent Harbor Road was also surveyed. Cultural materials were collected at two sites located between the bluff and the shoreline. These materials included various species of marine shell, fire-cracked rock, and flakes.

Two sites along the south side of Crescent Harbor Road consisted of several historic features, probably the remnants of maintenance structures associated with 20th century farming or dairy industry. Features consisted of concrete foundations, concrete walkways and driveways, an associated ditch and a well, and a fence line that may be part of a corral or enclosure. One feature contained the remnants of a boiler. The cultural materials collected include ceramics, square-cut nails, clear flat glass, green glass, wire-cut nails, regular nails, bottle fragments, and calcined bone.

An historic landfill was located on the shoreline terrace of Crescent Harbor. Cultural materials appear to date to the 1940s and 1950s. Artifacts recovered included bone, metal, glass, ceramic, shell, milled wood, bottle glass, nails, and concrete fragments. There is considerable potential that these sites, as well as a small discrete shell midden on a relatively flat bench on a heavily wooded slope north of Eerkes Spring, have intact archaeological deposits.

## **5.13 Environmental Management**

### **5.13.1 Hazardous Materials and Waste Management**

A variety of hazardous materials are used at NAS Whidbey Island, including petroleum, oils, and lubricants (POLs); solvents and thinners; caustic cleaning compounds and surfactants; cooling fluids (antifreeze); adhesives; acids and corrosives; paints; and herbicides, pesticides, and fungicides. Hazardous materials are used for aircraft and vehicle repair and maintenance activities at the installation. Hazardous waste-generating activities include painting; solvent cleaning and degreasing; mechanical and chemical paint and rust removal; fluids change-out; electroplating; metal casting; machining; and welding or soldering. If not consumed during use, these materials and possibly their containers eventually may be disposed of as a solid or hazardous waste.

The DoD collects all annual hazardous- and solid-waste generation data for each Navy, Marine Corps, and Air Force installation in order to track its progress in meeting its goals for waste reduction. Waste categories in the Pollution Prevention Annual Data Summary are defined by source of the waste, such as a plating shop (electroplating and circuit-board manufacturing processes), fluids change (i.e., used solvents, hydraulic fluids, lubricants), facility operations (i.e., cleaning and maintenance, pest-management applications, used batteries), chemical paint stripping, painting operations, and rust and coating removal.

NAS Whidbey Island is a large-quantity generator of hazardous waste, as defined by the Resource Conservation and Recovery Act (RCRA), a status applying to facilities generating 2,200 pounds (1,000 kilograms [kg]) or more of hazardous waste. In calendar year (CY) 2006, NAS Whidbey Island generated 132,000 pounds of hazardous waste. Further review of waste generation data by squadron shows the approximate waste generation per P-3C squadron averaged 3,000 pounds in CY 2006, approximately 2.3% of the total waste stream for NAS Whidbey Island.

Hazardous wastes are accumulated at less-than-90-day satellite accumulation points throughout the station before being transferred to permitted storage facilities and are collected and stored on-site in accordance with NAS Whidbey Island's RCRA Part B permit. The Defense Reutilization and Marketing Office (DRMO) is responsible for contracting off-site disposal of most hazardous waste.

### **5.13.2 Installation Restoration Program (IRP) Sites**

There are 23 sites at NAS Whidbey Island in various stages of investigation and remediation under the IRP. There are no sites within the proposed project construction area. The closest site, northeast of the existing aircraft parking apron and runways, is a complex of ditches consisting of approximately 9 miles of connected ditches and culverts draining the runway area and receiving discharges from many of the station's storm drains. Previous dumping and spills have contaminated the ditch sediments with total petroleum hydrocarbons, lead, arsenic, and pesticides. A Record of Decision (ROD) was signed in April 1995: approximately 6,000 cubic yards of contaminated sediments were excavated from the ditch complex and disposed of before being capped. In May 1996, the Navy completed construction work, including restoration.

## **6 Environmental Consequences: NAS Whidbey Island**

NAS Whidbey Island is a site for replacing P-3C aircraft with P-8A MMA under all alternatives other than the No Action Alternative. The following is a brief summary of aircraft replacements at NAS Whidbey Island proposed under each alternative.

- **Alternative 1.** Three fleet squadrons would be stationed at NAS Whidbey Island. P-8A MMA personnel would number 904, representing a loss of 608 when compared with the number of P-3C personnel.
- **Alternative 2.** Seven fleet squadrons would be stationed at NAS Whidbey Island. P-8A MMA personnel would number 1,883, representing an addition of 371 when compared with the number of P-3C personnel.
- **Alternative 3.** Five fleet squadrons would be stationed at NAS Whidbey Island. P-8A MMA personnel would number 1,476, representing a loss of 36 when compared with the number of P-3C personnel.
- **Alternative 4.** Five fleet squadrons and a fleet replacement squadron (FRS) would be stationed at NAS Whidbey Island. P-8A MMA personnel would number 1,785, representing an addition of 273 when compared with the number of P-3C personnel.
- **Alternative 5 (Preferred Alternative).** Four fleet squadrons would be stationed at NAS Whidbey Island. P-8A MMA personnel would number 1,194, representing a loss of 318 when compared with the number of P-3C personnel.
- **Alternative 6.** Four fleet squadrons and an FRS would be stationed at NAS Whidbey Island. P-8A MMA personnel would number 1,503, representing a loss of 9 when compared with the number of P-3C personnel.

Discussions of potential environmental impacts associated with all alternatives at NAS Whidbey Island are included in this section. Section 1 of this EIS defines 2011 as the baseline year for the analysis presented here because it is the year prior to the introduction of the P-8A MMA. However, in a few instances the best available data were available only for an alternate year, ranging from 2010 to 2013. In such instances, where data from a year other than 2011 were used to support the analysis, the year and data source is specifically identified within the text. The baseline also defines the No Action Alternative conditions.

Tables 6-1, 6-2, and 6-3 are provided to guide the evaluation of proposed environmental impacts. The sites for proposed new construction at NAS Whidbey Island are shown in Figures 2-7, 2-8, and 2-9 in Section 2, Proposed Action and Alternatives.

**Table 6-1 Baseline (2011) and Projected (2019) Personnel Loading at NAS Whidbey Island**

Personnel	Baseline (2011)	Alternative 1 (2019)	Alternative 2 (2019)	Alternative 3 (2019)	Alternative 4 (2019)	Alternative 5 (2019)	Alternative 6 (2019)
P-3C	1,512	0	0	0	0	0	0
P-8A MMA	0	904	1,883	1,476	1,785	1,194	1,503
<b>Net Change</b>	<b>–</b>	<b>(-)608</b>	<b>371</b>	<b>(-)36</b>	<b>273</b>	<b>(-)318</b>	<b>(-)9</b>

**Table 6-2 Projected Areas of Impact from New Construction at NAS Whidbey Island**

Proposed New Construction	Alternative 1 (2019)	Alternative 2 (2019)	Alternative 3 (2019)	Alternative 4 (2019)	Alternative 5 (2019)	Alternative 6 (2019)
Privately owned vehicle (POV) Parking	22,544 sq. ft.	70,975 sq. ft.	154,684 sq. ft.	63,863 sq. ft.	22,544 sq. ft.	102,796 sq. ft.
Hangar (2-, 3-, 4-, 5-, or 6-Bay)	175,128 sq. ft.	376,404 sq. ft.	292,296 sq. ft.	413,970 sq. ft.	222,254 sq. ft.	336,674 sq. ft.
Tactical Support Center (TSC)	33,700 sq. ft.	35,800 sq. ft.	35,800 sq. ft.	35,800 sq. ft.	35,800 sq. ft.	35,800 sq. ft.
South Air Area	187,200 sq. ft.	187,200 sq. ft.	187,200 sq. ft.	187,200 sq. ft.	187,200 sq. ft.	187,200 sq. ft.
Parking Apron Expansion	0 sq. ft.	1,212,300 sq. ft.	346,500 sq. ft.	1,212,300 sq. ft.	0 sq. ft.	1,212,300 sq. ft.
Replacement of Existing Displaced Facilities	3,300 sq. ft.	14,678 sq. ft.	14,678 sq. ft.	14,678 sq. ft.	3,300 sq. ft.	14,678 sq. ft.
<b>Total Area Affected</b>	<b>421,872 sq. ft.</b>	<b>1,897,357 sq. ft.</b>	<b>1,031,158 sq. ft.</b>	<b>1,927,811 sq. ft.</b>	<b>471,098 sq. ft.</b>	<b>1,889,448 sq. ft.</b>

**Table 6-3 Baseline (2011) and Projected (2019) Aircraft Loading at NAS Whidbey Island**

Aircraft Type	Baseline (2011)	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6
C-9B	4	4	4	4	4	4	4
EA-18G	49	59	59	59	59	59	59
EA-6B	12	0	0	0	0	0	0
EP-3 <sup>1</sup>	12	12	12	12	12	12	12
P-3C	36	6	6	6	6	6	6
MH-60S	2	2	2	2	2	2	2
P-8A MMA	0	18	42	30	42	24	36
<b>Total</b>	<b>115</b>	<b>101</b>	<b>125</b>	<b>113</b>	<b>125</b>	<b>107</b>	<b>119</b>
<b>Net Change</b>	<b>–</b>	<b>(-)14</b>	<b>10</b>	<b>(-)2</b>	<b>10</b>	<b>(-)8</b>	<b>4</b>

Note:

<sup>1</sup> The EP-3 aircraft are not part of the P-8A MMA replacement action.

## **6.1 Airfield Operations**

The projected number of annual aircraft operations was calculated using the *Patrol Reconnaissance Group Projected P-8 Syllabus Flight Operations*. As a result, the number of annual operations at NAS Whidbey Island is projected to decrease under Alternatives 1 and 5 by 7% and <1% respectively. The number of annual operations is projected to increase under Alternatives 2, 3, 4, and 6 by 30%, 8%, 31%, and 23% respectively. The threshold for an increase in P-8A MMA air operations when compared with the P-3C baseline operations lies in the addition of the FRS or in the increase from five to seven fleet squadrons (see Table 6-4). Generally, when compared with the same number of aircraft and fleet squadrons the P-8A MMA represents a reduction of 7% (Alternative 1) in air operations over the P-3C. A key component of this decrease would be the increased use of flight simulators for training. Simulators minimize flight operation, thereby decreasing air emissions and enhancing safety by allowing personnel to practice emergency procedures without putting pilot and aircraft at risk.

The existing three fleet squadrons of P-3C aircraft at NAS Whidbey Island would be replaced with the following:

- Three P-8A MMA fleet squadrons (Alternative 1);
- Three P-8A MMA fleet squadrons plus four additional P-8A MMA fleet squadrons (Alternative 2) for a total of seven fleet squadrons;
- Three P-8A MMA fleet squadrons plus two additional P-8A MMA fleet squadrons (Alternative 3) for a total of five fleet squadrons;
- Three P-8A MMA fleet squadrons and two additional P-8A MMA fleet squadrons for a total of five fleet squadrons and the FRS (Alternative 4);
- Three P-8A MMA fleet squadrons plus one additional P-8A MMA fleet squadron for a total of four fleet squadrons (Alternative 5);
- Three P-8A MMA fleet squadrons plus one additional P-8A MMA fleet squadron for a total of 4 fleet squadrons and an FRS (Alternative 6); and
- No aircraft would be replaced and the three fleet squadrons of P-3C aircraft would remain at NAS Whidbey Island (No Action Alternative).

The P-8A MMA squadrons would follow the same training and deployment cycle as that of the P-3C squadrons, and no change is proposed to existing types of flight operations or flight tracks. Projected operations would consist primarily of direct arrivals and departures, with the remaining operations including touch-and-go and ground control approach (GCA) patterns.

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**Table 6-4 Projected 2019 Basic Operations at NAS Whidbey Island**

	Baseline and No Action Alternative Condition Total	Alternative 1			Alternative 2			Alternative 3			Alternative 4			Alternative 5 Preferred Alternative			Alternative 6		
		Day (7:00 a.m. to 10:00 p.m.)	Night (10:00 p.m. to 7:00 a.m.)	Total	Day (7:00 a.m. to 10:00 p.m.)	Night (10:00 p.m. to 7:00 a.m.)	Total	Day (7:00 a.m. to 10:00 p.m.)	Night (10:00 p.m. to 7:00 a.m.)	Total	Day (7:00 a.m. to 10:00 p.m.)	Night (10:00 p.m. to 7:00 a.m.)	Total	Day (7:00 a.m. to 10:00 p.m.)	Night (10:00 p.m. to 7:00 a.m.)	Total	Day (7:00 a.m. to 10:00 p.m.)	Night (10:00 p.m. to 7:00 a.m.)	Total
EA-18G																			
Departure	4,588	4,255	333	4,588	4,255	333	4,588	4,255	333	4,588	4,255	333	4,588	4,255	333	4,588	4,255	333	4,588
Arrival	4,588	4,235	353	4,588	4,235	353	4,588	4,235	353	4,588	4,235	353	4,588	4,235	353	4,588	4,235	353	4,588
Touch-and-Go	9,139	8,727	412	9,139	8,727	412	9,139	8,727	412	9,139	8,727	412	9,139	8,727	412	9,139	8,727	412	9,139
FCLP	18,282	15,122	3,160	18,282	15,122	3,160	18,282	15,122	3,160	18,282	15,122	3,160	18,282	15,122	3,160	18,282	15,122	3,160	18,282
Depart and Re-enter	243	226	17	243	226	17	243	226	17	243	226	17	243	226	17	243	226	17	243
GCA Pattern	3,681	1,936	1,745	3,681	1,936	1,745	3,681	1,936	1,745	3,681	1,936	1,745	3,681	1,936	1,745	3,681	1,936	1,745	3,681
Total	40,521	34,501	6,020	40,521	34,501	6,020	40,521	34,501	6,020	40,521	34,501	6,020	40,521	34,501	6,020	40,521	34,501	6,020	40,521
P-3C																			
Departure	1,599	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Arrival	1,599	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Touch-and-Go	19,040	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FCLP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Depart and Re-enter	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GCA Pattern	3,768	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	26,006	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EP-3 <sup>1</sup>																			
Departure	640	621	19	640	621	19	640	621	19	640	621	19	640	621	19	640	621	19	640
Arrival	640	621	19	640	621	19	640	621	19	640	621	19	640	621	19	640	621	19	640
Touch-and-Go	7,536	7,536	0	7,536	7,536	0	7,536	7,536	0	7,536	7,536	0	7,536	7,536	0	7,536	7,536	0	7,536
FCLP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Depart and Re-enter	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GCA Pattern	1,507	1,507	0	1,507	1,507	0	1,507	1507	0	1,507	1,507	0	1507	1507	0	1507	1507	0	1507
Total	10,323	10,285	38	10,323	10,285	38	10,323	10,285	38	10,323	10,285	38	10,323	10,285	38	10,323	10,285	38	10,323
C-9																			
Departure	325	211	114	325	211	114	325	211	114	325	211	114	325	211	114	325	211	114	325
Arrival	325	211	114	325	211	114	325	211	114	325	211	114	325	211	114	325	211	114	325
Touch-and-Go	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FCLP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Depart and Re-enter	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



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**Table 6-4 Projected 2019 Basic Operations at NAS Whidbey Island (continued)**

	Baseline and No Action Alternative Condition Total	Alternative 1			Alternative 2			Alternative 3			Alternative 4			Alternative 5 Preferred Alternative			Alternative 6		
		Day (7:00 a.m. to 10:00 p.m.)	Night (10:00 p.m. to 7:00 a.m.)	Total	Day (7:00 a.m. to 10:00 p.m.)	Night (10:00 p.m. to 7:00 a.m.)	Total	Day (7:00 a.m. to 10:00 p.m.)	Night (10:00 p.m. to 7:00 a.m.)	Total	Day (7:00 a.m. to 10:00 p.m.)	Night (10:00 p.m. to 7:00 a.m.)	Total	Day (7:00 a.m. to 10:00 p.m.)	Night (10:00 p.m. to 7:00 a.m.)	Total	Day (7:00 a.m. to 10:00 p.m.)	Night (10:00 p.m. to 7:00 a.m.)	Total
GCA Pattern	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>650</b>	<b>422</b>	<b>228</b>	<b>650</b>	<b>422</b>	<b>228</b>	<b>650</b>	<b>422</b>	<b>228</b>	<b>650</b>	<b>422</b>	<b>228</b>	<b>650</b>	<b>422</b>	<b>228</b>	<b>650</b>	<b>422</b>	<b>228</b>	<b>650</b>
<b>Transient Aircraft</b>																			
Departure	252	164	88	252	164	88	252	164	88	252	164	88	252	164	88	252	164	88	252
Arrival	252	164	88	252	164	88	252	164	88	252	164	88	252	164	88	252	164	88	252
Touch-and-Go	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FCLP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Depart and Re-enter	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GCA Pattern	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>504</b>	<b>328</b>	<b>176</b>	<b>504</b>	<b>328</b>	<b>176</b>	<b>504</b>	<b>328</b>	<b>176</b>	<b>504</b>	<b>328</b>	<b>176</b>	<b>504</b>	<b>328</b>	<b>176</b>	<b>504</b>	<b>328</b>	<b>176</b>	<b>504</b>
<b>P-8A MMA</b>																			
Departure	0	1,300	39	1,339	3,120	94	3,214	2,080	62	2,142	3,099	94	3,193	1,690	51	1,741	2,709	83	2,792
Arrival	0	1,300	39	1,339	3,120	94	3,214	2,080	62	2,142	3,099	94	3,193	1,690	51	1,741	2,709	83	2,792
Touch-and-Go	0	14,840	0	14,840	35,616	0	35,616	23,744	0	23,744	36,560	0	36,560	19,291	0	19,292	32,108	0	32,108
FCLP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Depart and Re-enter	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GCA Pattern	0	2,968	0	2,968	7,124	0	7,124	4,748	0	4,748	7,312	0	7,312	3,858	0	3,858	6,422	0	6,422
<b>Total</b>	<b>0</b>	<b>20,408</b>	<b>78</b>	<b>20,486</b>	<b>48,980</b>	<b>188</b>	<b>49,168</b>	<b>32,652</b>	<b>124</b>	<b>32,776</b>	<b>50,070</b>	<b>188</b>	<b>50,258</b>	<b>26,530</b>	<b>102</b>	<b>26,632</b>	<b>43,948</b>	<b>166</b>	<b>44,114</b>
Airfield Total	78,004			72,484			101,166			84,774			102,256			78,630			96,112
Net Change	–			(-)5,520			23,162			6,770			24,252			(-)626			18,108
<b>Percent Net Change</b>				<b>(-)7%</b>			<b>30%</b>			<b>8%</b>			<b>31%</b>			<b>&lt;[-]1%</b>			<b>23%</b>

Source: Wyle Laboratories, Inc. July 2008; Duquette 2008

Note:

<sup>1</sup> The EP-3 aircraft are not part of the P-8A MMA replacement action.

Key:

FCLP = Field carrier landing practice.

GCA = Ground control approach.

Under Alternative 1, the projected number of operations at NAS Whidbey Island would decrease by 5,520 operations, or 7% below the baseline (2013) level of annual operations. Under Alternative 2, in which all three of the P-3C squadrons at NAS Whidbey Island would be replaced by seven P-8A MMA squadrons, the number of operations conducted would increase by 23,162 operations or 30%. Alternative 3 would replace the three existing P-3C squadrons with five P-8A MMA squadrons. Annual operations would increase by 6,770 operations or 8%.

Alternative 4 is similar to Alternative 3 in that five P-8A MMA squadrons would replace the three existing P-3C squadrons at NAS Whidbey Island. However, the FRS would also be included under Alternative 4 and therefore the projected number of operations would increase by 24,252 operations or 31%. This represents the largest increase in aircraft operations.

Alternative 5 would replace the three existing P-3C squadrons with four P-8A MMA squadrons. Annual operations would decrease by 525 operations, or less than 1%. Alternative 6 is similar to Alternative 5 in that four P-8A MMA squadrons would replace the three existing P-3C squadrons. However, the FRS would also be included under Alternative 6 and therefore the projected number of operations would increase by 18,108 operations or 23%.

Under the No Action Alternative, there would be no change in the number of annual air operations (75,988).

NAS Whidbey Island meets all the operational requirements of routine operating conditions to support the airfield operations of the P-8A MMA squadrons and FRS.

## **6.2 Noise**

The noise analysis in this section is presented in two parts. First, a detailed discussion on the day-night average sound level (DNL) changes due to the replacement of the P-3C with the P-8A MMA is presented. The 24-hour DNL is a reliable measure of community sensitivity to aircraft noise and is the Federal Aviation Administration's (FAA) standard noise metric used in the United States to measure the effects of aircraft noise for both commercial airports and military installations. The DNL takes into account both the noise levels of all individual events that occur during a 24-hour period and the number of times of those events. The 65 decibel (dB) DNL is the lowest noise contour for which Navy guidance on incompatible land uses is provided. DNL noise contours have historically been used as the noise metric for NAS Whidbey Island.

Secondly, in response to comments received during the draft EIS public comment period, the discussion presents an analysis of the sound exposure levels (SEL) for single event aircraft overflights. The SEL value represents the sound energy exposure at a specific location resulting from a specific aircraft operation. It is provided here to allow the reader to make a comparison in the relative difference in sound emitted by two different aircraft. A full discussion on noise modeling and the background data for this analysis are included in Appendix F.

### **6.2.1 Day-Night Average Sound Levels (DNL) at Whidbey Island**

The projected noise contours are very similar under all alternatives, with virtually no difference (0% to less than 1%) between the off-station land areas for each alternative within the greater-than-65 dB DNL noise contours. The uniformity between the baseline conditions and the proposed alternatives is due to the following factors:

- The E/A-18G is the dominant noise contributor at NAS Whidbey Island.
- Operations would remain the same under all of the alternatives (Table 6-4).
- Noise levels for the P-3C and P-8A MMA flight profiles are similar (Table 6-5) for takeoffs and landings (Wyle Laboratories, Inc. July 2008).
- Noise levels for the P-8A MMA flight profiles are noticeably louder than the P-3C for touch and go operations (Wyle Laboratories, Inc. July 2008); however, this difference is masked by the E/A-18G operations.

Therefore, the noise impacts for all of the alternatives at NAS Whidbey Island would remain consistent or virtually unchanged when compared with existing conditions.

**Table 6-5 Comparative Single-Event Sound Levels for the P-3C, P-8A MMA, and the EA-18G**

Condition	SEL for Flyover at 1,000 feet AGL		
	P-3C	P-8A MMA	EA-18G
Takeoff	94	95	117
Approach	85	87	113
Touch-and-Go – Downwind	86	94	113

Key:  
AGL = above ground level.

Projected noise contours for NAS Whidbey Island under each replacement alternative are shown on Figures 6-1 through 6-6. The off-station area and estimated population within projected noise contours at NAS Whidbey Island under each of the replacement alternatives are shown in Table 6-6. Population projections for 2019 were based on 2000 U.S. Census data: as-

suming a growth rate of 1.2%, the population growth rate for Island County was projected from 2000 to 2013 and was then further extrapolated to 2019. Whether three fleet squadrons (Alternative 1), four fleet squadrons (Alternative 5), five fleet squadrons (Alternative 3), seven fleet squadrons (Alternative 2), or four or five fleet squadrons and the FRS (Alternatives 6 and 4) are sited at NAS Whidbey Island, the projected increase in the number of people exposed to the 65 decibel (dB) DNL or greater noise zone around the base is virtually identical to the projected population growth of Island County of 7% between 2013 and 2019, compared with baseline conditions. Essentially, the projected noise contours for all the alternatives are very similar, with virtually no difference (0% to less than 1%) between the off-station land areas for each alternative within the greater-than-65 dB DNL noise contours.

**Table 6-6 Off-Station Area (Acres) and Estimated Population within Projected Noise Zones at NAS Whidbey Island Under All Alternatives**

	Baseline and No Action Alternative (2013)		Alternative 1 (2019)		Alternative 2 (2019)		Alternative 3 (2019)		Alternative 4 (2019)		Alternative 5 (Preferred Alternative) (2019)		Alternative 6 (2019)	
	Area	Pop.	Area	Pop.	Area	Pop.	Area	Pop.	Area	Pop.	Area	Pop.	Area	Pop.
65 to 70 dB	2,642	3,179	2,694	3,390	2,738	3,401	2,739	3,397	2,739	3,402	2,738	3,394	2,739	3,399
70 to 75 dB	3,925	2,618	3,914	2,791	3,904	2,786	3,910	2,788	3,903	2,786	3,912	2,789	3,905	2,787
75 dB or greater	5,091	3,055	5,012	3,268	5,033	3,284	5,021	3,277	5,035	3,285	5,016	3,274	5,029	3,282
<b>Total</b>	11,658	8,852	11,620	9,449	11,675	9,471	11,670	9,462	11,677	9,473	11,666	9,457	11,673	9,468
<b>Net Change</b>	0	0	(-)38	597	17	619	12	610	19	621	8	605	15	616
<b>Percent Net Change</b>	0	0	<1	7%	<1	7%	<1	7%	<1	7%	<1	7%	<1	7%

### 6.2.2 Sound Exposure Level (SEL) Analysis

Although the DNL is the standard metric for expressing aircraft noise impacts, in response to comments received on the draft EIS, this document provides a discussion on single-event noise level analysis. As outlined in Section 5.2, the SEL (as opposed to the DNL, which represents a 24-hour average noise metric) is a composite metric that represents both the intensity of a sound and its duration. The SEL shows the effect of an individual noise event such as an aircraft overflight. Table 6-6 shows the comparative difference in SEL noise values for the P-3C and the P-8A MMA. The EA-18G is also shown in the table because of its influence on the noise environment at NAS Whidbey Island.

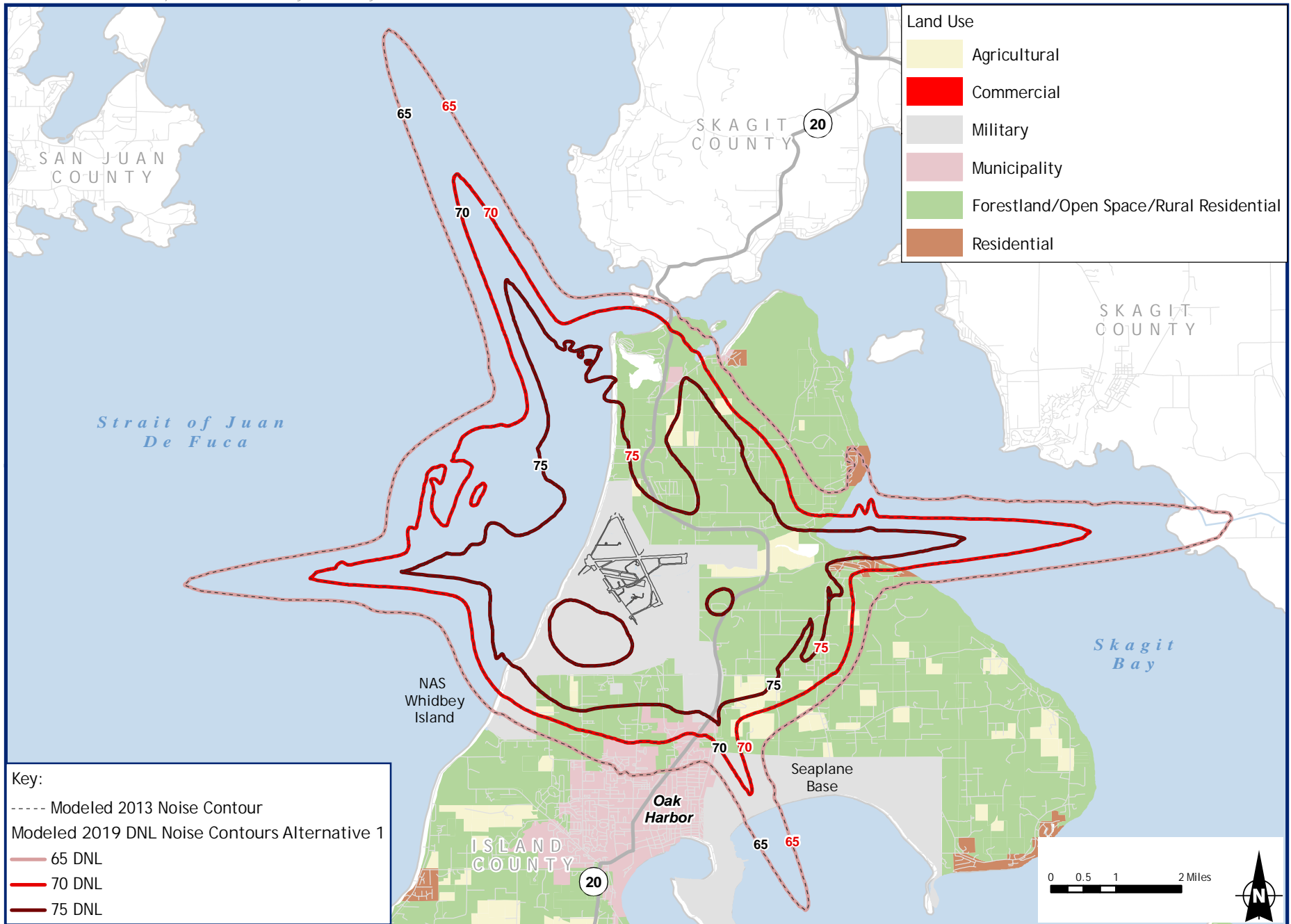


Figure 6-1  
 Comparison of Modeled 2013 DNL Noise Contours  
 and 2019 DNL Noise Contours Projected Under Alternative 1  
 NAS Whidbey Island, Washington

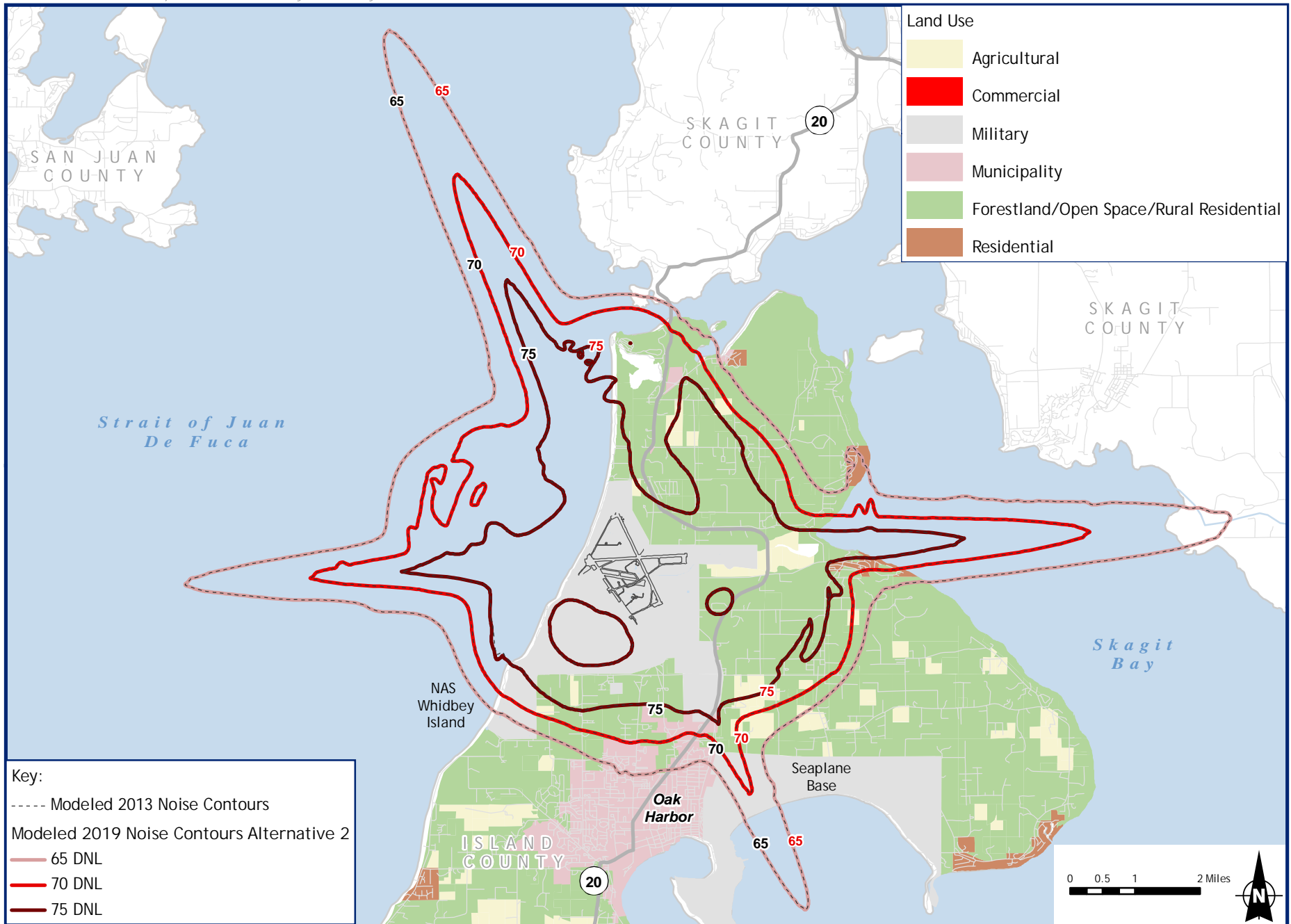


Figure 6-2  
 Comparison of Modeled 2013 DNL Noise Contours  
 and 2019 DNL Noise Contours Projected Under Alternative 2  
 NAS Whidbey Island, Washington

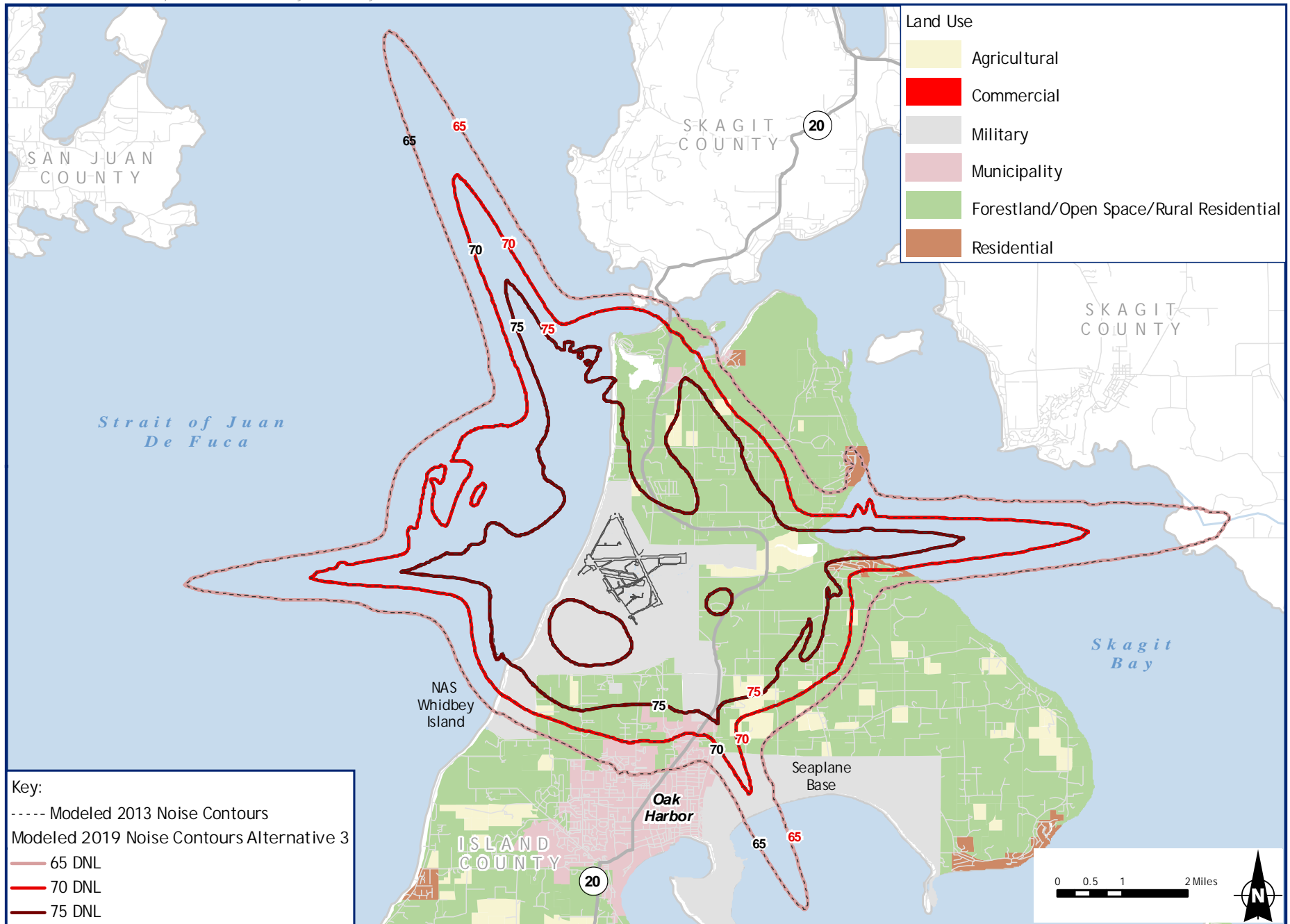


Figure 6-3  
 Comparison of Modeled 2013 DNL Noise Contours  
 and 2019 DNL Noise Contours Projected Under Alternative 3  
 NAS Whidbey Island, Washington



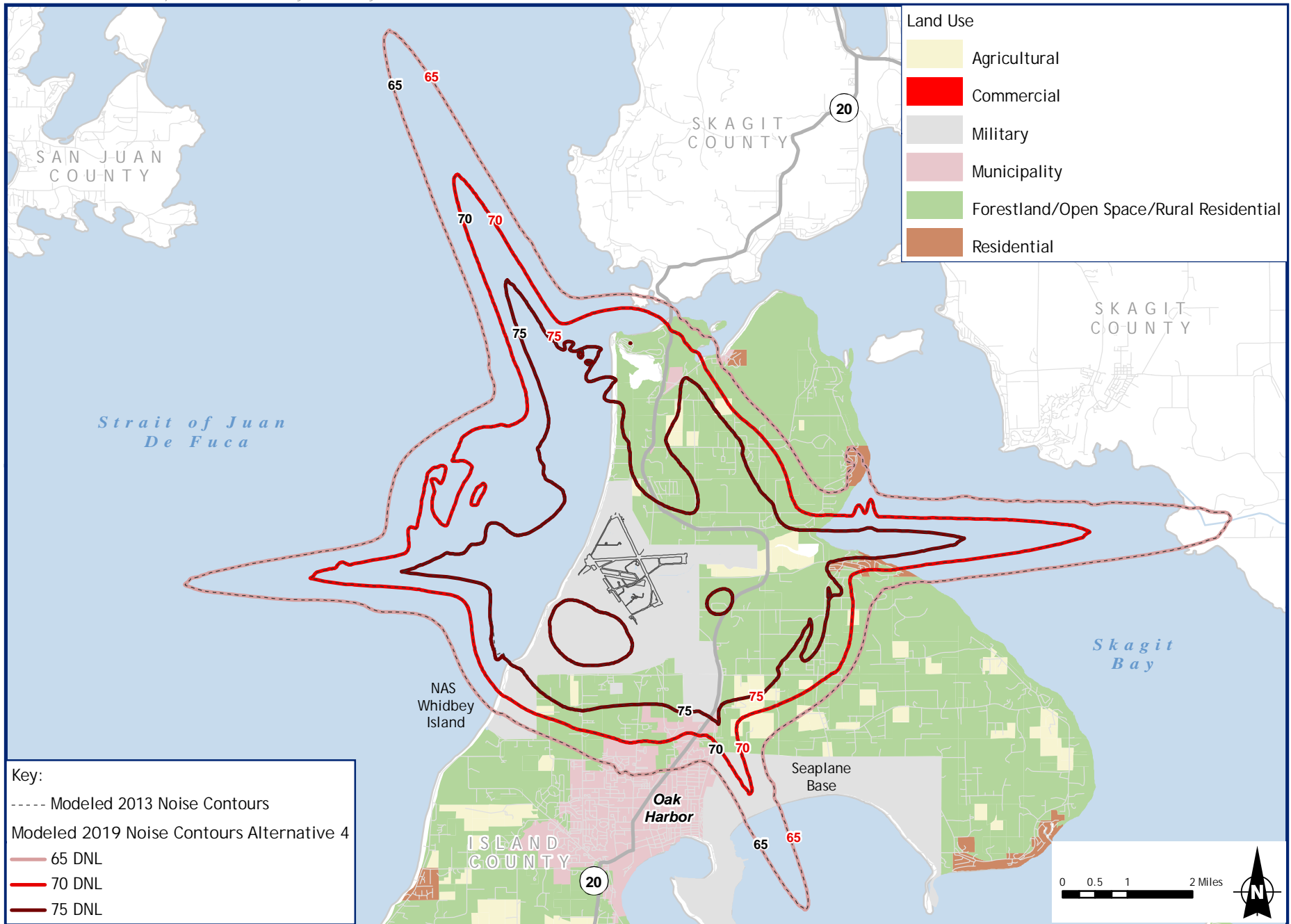


Figure 6-4  
 Comparison of Modeled 2013 DNL Noise Contours  
 and 2019 DNL Noise Contours Projected Under Alternative 4  
 NAS Whidbey Island, Washington



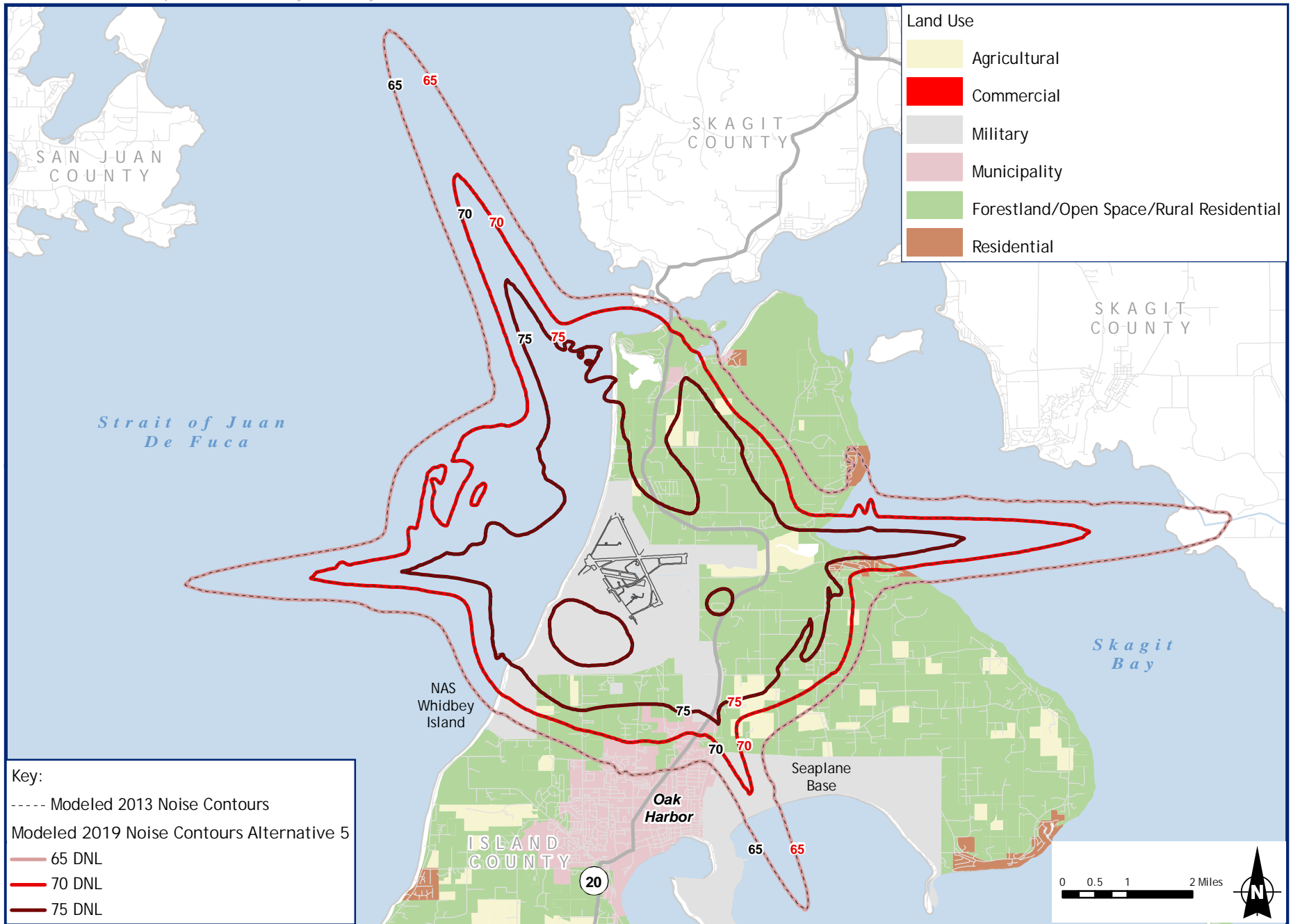


Figure 6-5  
 Comparison of Modeled 2013 DNL Noise Contours  
 and 2019 DNL Noise Contours Projected Under Alternative 5  
 NAS Whidbey Island, Washington

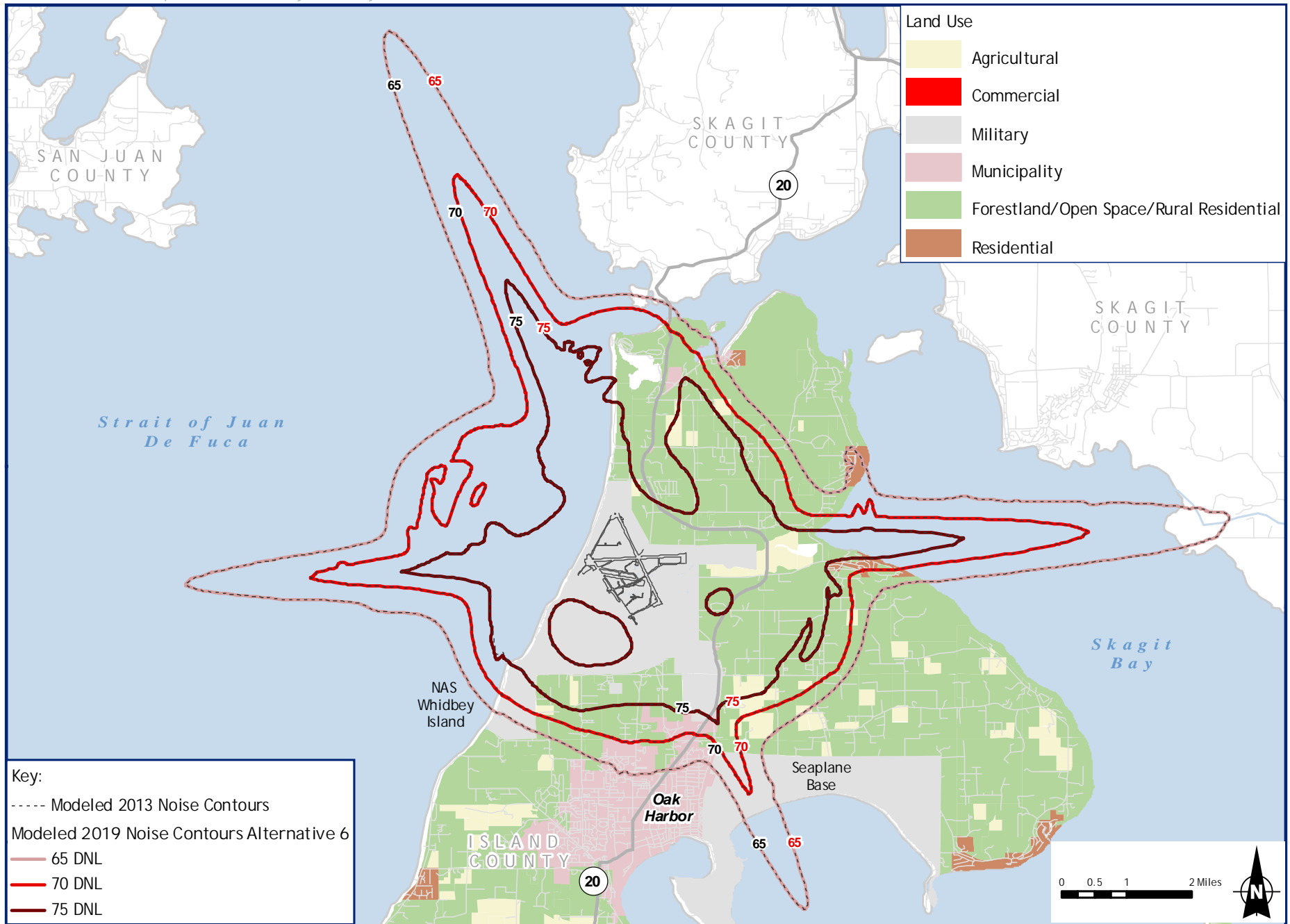


Figure 6-6  
 Comparison of Modeled 2013 DNL Noise Contours  
 and 2019 DNL Noise Contours Projected Under Alternative 6  
 NAS Whidbey Island, Washington

The P-3C, as a turboprop, and the P-8A MMA, as a jet aircraft, generally have different noise characteristics. For example, the P-8A MMA exhibits more noise in some higher frequency bands during approach (2,500 hertz [Hz] to 5,000 Hz) than the P-3C and, as a result, while the overall sound energy of the two aircraft is similar, people on the ground will likely detect the “whine” from the P-8A MMA turbofan engines during approach operations. However, the actual increase in total sound energy at a distance of 1,000 feet during approach operations for a P-8A MMA would range only from 1 dB to 2 dB. A larger difference in SEL noise values can be found when comparing touch-and-go operations between the aircraft. In this case the P-8A MMA is, on average, about 8 dB louder than the P-3C. However, the difference in noise from the P-8A MMA becomes negligible because the EA-18G with a modeled touch-and-go SEL value of 113 dB SEL is another 9 dB SEL louder than the P-8A MMA and remains the acoustically dominant aircraft at NAS Whidbey Island.

### **Points of Interest Analysis**

Noise exposures at selected locations in the vicinity of NAS Whidbey Island were analyzed for single-event noise levels. The Navy identified four locations within the surrounding communities and near NAS Whidbey Island as points of interest to the community. The locations were selected based on comments received during the public comment period and were chosen to represent public areas in the vicinity of NAS Whidbey Island. (Note that the modeled sound is representative only for each individual location and does not provide a representative measure of the sound heard during aircraft overflights in other areas.) These locations are listed in Table 6-7 and shown on Figure 6-7.

**Table 6-7 Highest SEL Value (dB) for Modeled Aircraft Operations at Points of Interest for all Alternatives**

<b>Point of Interest</b>	<b>E/A-18G</b>	<b>P-3C</b>	<b>P-8A MMA</b>
City Beach Park	88.4	76	85
Olympic View Elementary School	102.1	78	87
Deception Pass State Park	110.2	85	85
La Conner Middle School	92.3	81	85

Table 6-7 shows the loudest operations for the E/A-18G, P-3C, and the P-8A MMA at four different locations in the vicinity of NAS Whidbey Island. At each modeled location the operations conducted by the E/A-18G are louder than the operations conducted by either the

P-3C or the P-8A MMA. A comparison of similar operations at both the City Beach Park and Olympic View Elementary School indicates that the P-8A MMA is approximately 9 dB SEL louder than the P-3C. At Deception Pass State Park and La Conner Middle School the difference in single-event noise is less and ranges between 0 and 4 dB SEL. As described in Section 6.2, for most operations the difference in the single-event sound level of the P-8A MMA can be described as noticeably louder than the P-3C.

## **6.3 Land Use**

### **6.3.1 NAS Whidbey Island Land Use**

Primary construction projects associated with all replacement alternatives at NAS Whidbey Island would include a new aircraft hangar with training facilities, associated POV parking, and an operational storage facility. In addition, an ordnance storage facility would be constructed and the parking apron would be expanded under Alternatives 2, 3, 4 and 6. The area of the new construction required to support the P-8A MMA squadrons under each of the replacement alternatives is provided in Table 6-2. The locations of the proposed construction projects are shown on Figure 2-8 in Section 2, Proposed Action and Alternatives.

Most of the new construction would occur at the southeastern end of the flight line either on or adjacent to areas currently developed to support airfield operations. Land use in this portion of Ault Field has been designated as “Operations” and “Logistics/Industrial.” Construction of new facilities in this area would be consistent with these current land-use designations and would maximize the use of vacant land close to the flight line.

Under the No Action Alternative no additional facilities would be constructed to support the current operations of P-3C aircraft; therefore, no changes in on-station land use would occur.

### **6.3.2 Regional Land Use**

The proposed personnel transitions under each replacement alternative at NAS Whidbey Island would have minor impacts on regional land use. All project-related construction would occur within the existing boundaries of NAS Whidbey Island and would not conflict with surrounding off-station land uses. The increase in personnel could cause indirect growth-induced impacts under Alternatives 2, 3, and 4. However, the projected population increase under these

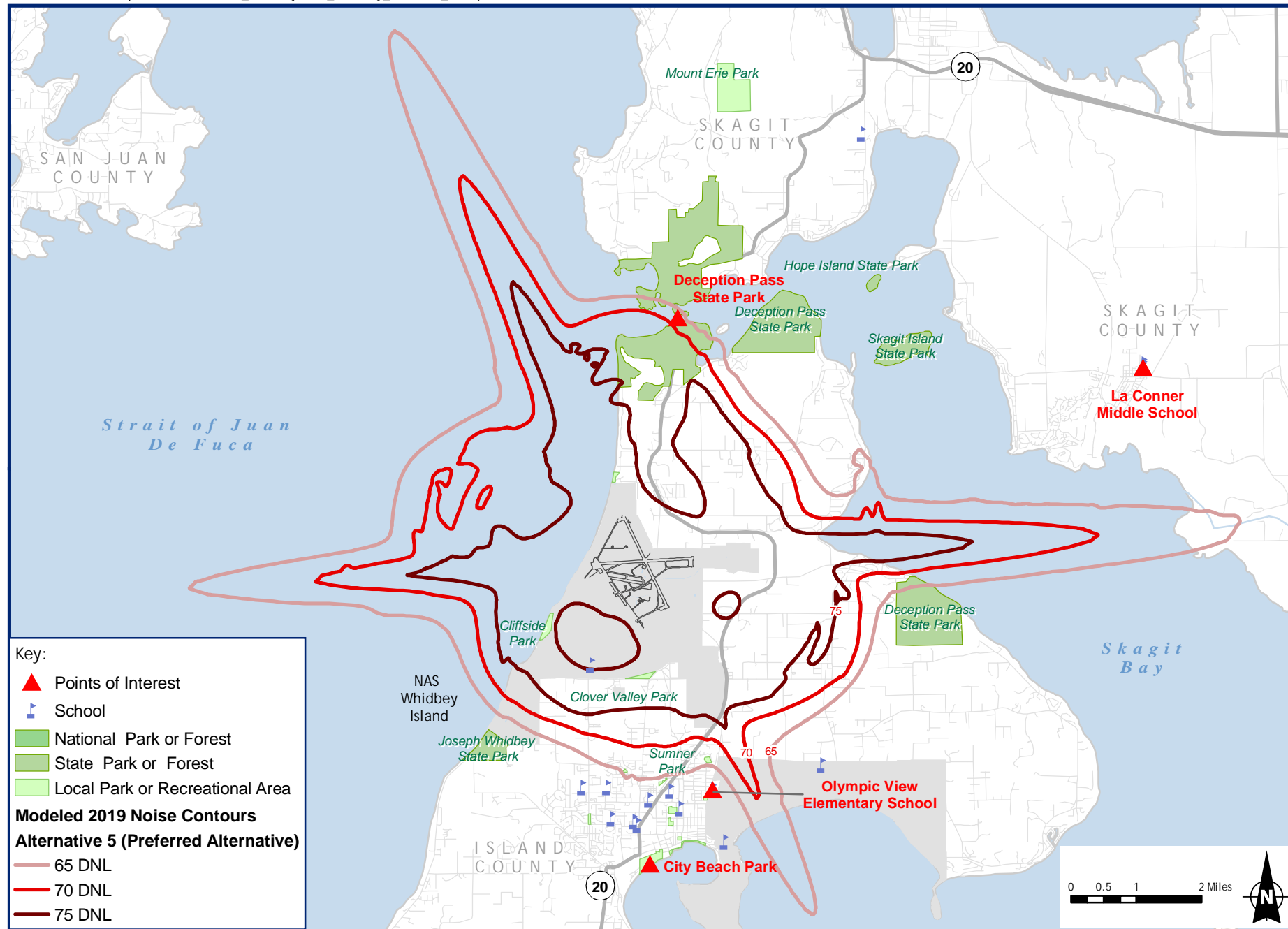


Figure 6-7  
 Points of Interest in the Vicinity of NAS Whidbey Island, Washington

alternatives would range from less than 1% to 2% of the Island County population, so any growth-induced impacts would be minor. It is expected that most new development would occur in the city of Oak Harbor, where concentrated development already exists.

The decrease in personnel under Alternative 1 would represent less than 2% of the Island County population and thus would not be considered significant enough to result in any residential or business foreclosures or abandonment of residential, commercial, or office establishments that would affect existing land use. The projected noise zones under the replacement alternatives would cover slightly more or less land off-station than contained in the 2013 baseline contours. A land-use compatibility assessment of the replacement alternatives is included in Section 6.3.4.

Under the No Action Alternative no new construction or personnel transitions would occur; therefore, regional land use would not be affected.

### **6.3.3 Land-Use Controls**

The proposed action has been evaluated relative to the following land-use controls:

- The Navy and Marine Corps Air Installations Compatible Use Zones (AICUZ) Program;
- The 2004 NAS Whidbey Island Activity Overview Plan (AOP);
- The NAS Whidbey Island Integrated Natural Resources Management Plan (INRMP);
- The 1994 NAS Whidbey Island Historic and Archaeological Resources Protection Plan (HARP);
- The 2005 Island County Comprehensive Plan and Zoning Code;
- The 2005 City of Oak Harbor Comprehensive Plan and Zoning Code;
- The Washington Growth Management Act (GMA); and
- The Washington State Coastal Zone Management (CZM) Program.

### **AICUZ Program**

**Noise.** Implementation of the proposed action under all alternatives would be consistent with the NAS Whidbey Island AICUZ Program. The projected noise zones following replacement of the P-3C with the P-8A MMA under all alternatives would result in a small decrease or increase in the amount of land area exposed to aircraft noise (e.g., greater-than-65 dB DNL), depending on the alternative selected. Consequently, it is not anticipated that NAS Whidbey Island would need to recommend a new AICUZ study. Furthermore, the proposed action would not

affect the goals of the AICUZ Program or the land-use recommendations for land that is considered compatible with aircraft operations and consistent with community development plans.

**APZs.** The number and type of airfield operations and the flight tracks are used as the basis for identifying accident potential zones (APZs) around an air station. While the projected number of airfield operations would be reduced at NAS Whidbey Island, the flight tracks would remain the same when the P-8A MMA replaces the P-3C. As a result, the baseline APZs at NAS Whidbey Island as shown in the 2005 AICUZ would not change under any of the replacement alternatives.

The No Action Alternative would have no effect on the current AICUZ Program because current aviation activities at NAS Whidbey Island would continue unchanged.

### **NAS Whidbey Island Activity Overview Plan (AOP)**

Implementation of any of the replacement alternatives would be consistent with the NAS Whidbey Island Activity Overview Plan. The primary facilities needed to support the P-8A MMA would be constructed in one of three locations previously identified in the Activity Overview Plan as flight line expansion areas. Furthermore, none of the new facilities would affect or be affected by the recommendations in the plan to demolish surplus infrastructure and relocate inappropriately sited functions and facilities.

Implementation of the No Action Alternative would not be compatible with the goal of the AOP to support the long-range vision for the Navy's presence at NAS Whidbey Island.

### **NAS Whidbey Island Integrated Natural Resources Management Plan (INRMP)**

New construction at Ault Field would remove between 7 and 34 acres of terrestrial habitat, not including wetlands. However, this represents no more than 1% of the total terrestrial habitats currently present on Ault Field. Consequently, the proposed action would have a negligible effect on the station's management practices that are implemented under the INRMP.

Under the No Action Alternative, natural resources at NAS Whidbey Island would not be affected.

### **NAS Whidbey Island Historic and Archaeological Resources Protection (HARP) Plan**

The Navy completed an archaeological survey to document the presence or absence of historic and prehistoric resources within the proposed construction areas in November. Depending on the final results of the survey and through consultation with the Washington State Historical Preservation Office (SHPO) in early 2008, appropriate mitigation measures would be developed to avoid impacts on cultural resources. Consequently, the proposed action would be consistent with the station's HARP Plan management objectives to protect and manage cultural resources at the station from potentially adverse effects.

Under the No Action Alternative, cultural resources at NAS Whidbey Island would not be affected.

### **Washington State Growth Management Act, Island County Comprehensive Plan and Zoning Code, and the City of Oak Harbor Comprehensive Plan and Zoning Code**

Because the projected noise zones associated with the replacement of the P-3C with the P-8A MMA would result in less land area within the noise contours of Ault Field, and the new construction would affect only on-station land use, implementation of any of the replacement alternatives would be consistent with the Washington State Growth Management Act, the Island County Comprehensive Plan and Zoning Code, and the City of Oak Harbor Comprehensive Plan and Zoning Code.

The No Action Alternative would have no effect on Island County or the city of Oak Harbor planning and zoning because current aviation activities at NAS Whidbey Island would continue unchanged.

### **Federal Consistency with Washington State Coastal Zone Management (CZM) Program**

Based on a comprehensive coastal consistency program and policy analysis, the Navy has determined that the proposed action would be consistent to the maximum extent practicable with applicable enforceable coastal zone policies of the federally approved Washington CZM Program. The Navy submitted a coastal zone consistency determination (CCD) on July 9, 2008. In a letter dated August 15, 2008, the Washington State Department of Ecology, in collaboration



with the U.S. Army Corps of Engineers (USACE), agreed to defer concurrence with the CCD until the Navy has submitted a Section 401 wetland permit for review to the USACE. A copy of the Navy's CCD and the Washington Department of Ecology response is included in Appendix J.

#### **6.3.4 Land-Use Compatibility Assessment**

Aircraft operations associated with replacement of the P-3C with the P-8A MMA would result in slightly more or less land area within the greater-than-65 dB DNL noise zones, depending on the alternative chosen (see Figures 6-1 through 6-6). Tables 6-8 through 6-13 show the change in land uses around NAS Whidbey Island between the existing and projected noise contours under each of the replacement alternatives.

**Table 6-8 Net Change in Area within Projected Greater-than-65 dB DNL Noise Zones around Ault Field under Alternative 1**

<b>Land Use</b>	<b>Total Area Baseline (acres)</b>	<b>Total Area Alternative 1 (acres)</b>	<b>Net Change (acres)</b>	<b>% Net Change</b>
Residential	237	237	0	0
Municipality	633	633	0	0
Park	740	740	0	0
Forestland/Open Space/Rural Residential	9,127	9,127	0	0
Agriculture	926	926	0	0
Water	17,039	17,034	(-)5	(-)<1
Military	4,457	4,459	2	<1
<b>Total</b>	<b>33,159</b>	<b>33,156</b>	<b>(-)3</b>	<b>(-)&lt;1</b>

**Table 6-9 Net Change in Area within the Projected Greater-than-65 dB DNL Noise Zones around Ault Field under Alternative 2**

<b>Land Use</b>	<b>Total Area Baseline (acres)</b>	<b>Total Area Alternative 2 (acres)</b>	<b>Net Change (acres)</b>	<b>% Net Change</b>
Residential	237	237	0	0
Municipality	633	635	2	<1
Park	740	741	1	<1
Forestland/Open Space/Rural Residential	9,127	9,136	9	<1
Agriculture	926	926	0	0
Water	17,039	17,054	15	(-)<1
Military	4,457	4,464	7	<1
<b>Total</b>	<b>33,159</b>	<b>33,193</b>	<b>34</b>	<b>&lt;1</b>

**Table 6-10 Net Change in Area within the Projected Greater-than-65 dB DNL Noise Zones around Ault Field under Alternative 3**

Land Use	Total Area Baseline (acres)	Total Area Alternative 3 (acres)	Net Change (acres)	% Net Change
Residential	237	237	0	0
Municipality	633	634	1	<1
Park	740	740	0	0
Forestland/Open Space/Rural Residential	9,127	9,131	4	<1
Agriculture	926	926	0	0
Water	17,039	17,042	3	<1
Military	4,457	4,461	4	<1
<b>Total</b>	<b>33,159</b>	<b>33,171</b>	<b>12</b>	<b>&lt;1</b>

**Table 6-11 Net Change in Area within the Projected Greater-than-65 dB DNL Noise Zones around Ault Field under Alternative 4**

Land Use	Total Area 2011 Baseline (acres)	Total Area Alternative 4 (acres)	Net Change (acres)	% Net Change
Residential	237	237	0	0
Municipality	633	635	2	<1
Park	740	741	1	<1
Forestland/Open Space/Rural Residential	9,127	9,136	9	<1
Agriculture	926	926	0	0
Water	17,039	17,054	15	<1
Military	4,457	4,464	7	<1
<b>Total</b>	<b>33,159</b>	<b>33,193</b>	<b>34</b>	<b>&lt;1</b>

**Table 6-12 Net Change in Area within the Projected Greater-than-65 dB DNL Noise Zones around Ault Field under Alternative 5**

Land Use	Total Area Baseline (acres)	Total Area Alternative 5 (acres)	Net Change (acres)	% Net Change
Residential	237	237	0	0
Municipality	633	634	1	<1
Park	740	740	0	0
Forestland/Open Space/Rural Residential	9,127	9,130	3	<1
Agriculture	926	926	0	0
Water	17,039	17,039	0	0
Military	4,457	4,460	3	<1
<b>Total</b>	<b>33,159</b>	<b>33,166</b>	<b>6</b>	<b>&lt;1</b>

**Table 6-13 Net Change in Area within the Projected Greater-than-65 dB DNL Noise Zones around Ault Field under Alternative 6**

Land Use	Total Area 2011 Baseline (acres)	Total Area Alternative 6 (acres)	Net Change (acres)	% Net Change
Residential	237	237	0	0
Municipality	633	635	2	<1
Park	740	741	1	<1
Forestland/Open Space/Rural Residential	9,127	9,135	8	<1
Agriculture	926	926	0	0
Water	17,039	17,050	11	<1
Military	4,457	4,463	6	<1
<b>Total</b>	<b>33,159</b>	<b>33,187</b>	<b>28</b>	<b>&lt;1</b>

In the vicinity of NAS Whidbey Island, replacing the P-3C with the P-8A MMA would result in a negligible change in noise exposure around Ault Field. Under each of the replacement alternatives, there would be a less than 1% overall decrease or increase in the acreage of land and water located within the projected greater-than-65 dB DNL noise zones. Furthermore, no additional residential land or related land uses that would be considered incompatible with aircraft operations would be located within the greater-than-65 dB DNL noise zones under any replacement alternative.

The No Action Alternative, represented as the baseline condition in Tables 6-8 through 6-13, would have no effect on land-use compatibility because current aviation activities at NAS Whidbey Island would continue unchanged.

## **6.4 Air Quality**

Air quality impacts associated with the proposed action would be related to emissions from short-term construction activities, long-term aircraft operations, and personnel commuting changes. Emissions under each of the alternatives would be below federal and state de minimis thresholds of 250 tpy for all criteria pollutants.

Construction may affect air quality primarily as a result of construction equipment emissions, paving and painting emissions, and fugitive dust from grading and earthmoving. These emissions are calculated separately from operational emissions because they are temporary and would occur before full implementation of the chosen action. New operational emissions would result from the flight operations of the P-8A MMA aircraft and commuting activities of new sta-

tion personnel. Because these new emissions would be offset by decreased emissions as a result of the discontinued use of the P-3C aircraft, the *total changes* in emissions have been evaluated. Other site emissions, such as those from stationary sources, other aircraft, ground support equipment (GSE), and other sources, are assumed to remain constant under this action. Cumulative impacts are discussed in Section 11.

#### **6.4.1 Construction Emissions**

Table 6-14 provides information regarding estimated new construction at NAS Whidbey Island under all alternatives. Construction emissions have been estimated using guidelines published by the El Dorado County, California Air Pollution Control District (APCD) California Environmental Quality Act (CEQA) Guide (February 2002) and the U.S. Environmental Protection Agency (EPA) AP-42 (1995), based on estimates of equipment to be used, on average, throughout the year, assuming a one-year construction period and 250 workdays per year. A workday is assumed to be eight hours long. Particulate emissions from site preparation and demolition activities are also considered. Total projected annual construction emissions in tons per year (tpy) at NAS Whidbey Island under each alternative are listed in Table 6-14. The construction equipment, activities, emission factors, and calculations are detailed in Appendix H.

#### **6.4.2 Mobile Source Emissions**

Mobile source emissions considered in this analysis include P-8A MMA flight and maintenance operations and vehicles operated by new station personnel (privately owned vehicles [POVs]). Aircraft operation emission totals and the change in emission totals for aircraft and POV operations that would result from this action are listed in Table 6-15.

**Table 6-14 Construction Emissions NAS Whidbey Island, All Alternatives**

Activity	Emissions (tpy)			
	NO <sub>x</sub>	VOCs	CO	PM <sub>10</sub>
<b>Alternative 1</b>				
Construction equipment	43.91	4.63	28.49	2.31
VOCs from paving and painting		7.23		
PM <sub>10</sub> from site preparation and demolition				7.24
<b>Total</b>	<b>43.91</b>	<b>11.86</b>	<b>28.49</b>	<b>9.55</b>
<b>Alternative 2</b>				
Construction equipment	121.23	12.78	78.64	6.38
VOCs from paving and painting		22.44		

**Table 6-14 Construction Emissions NAS Whidbey Island, All Alternatives (continued)**

Activity	Emissions (tpy)			
	NO <sub>x</sub>	VOCs	CO	PM <sub>10</sub>
PM <sub>10</sub> from site preparation and demolition				8.34
<b>Total</b>	<b>121.23</b>	<b>35.22</b>	<b>78.64</b>	<b>14.72</b>
<b>Alternative 3</b>				
Construction equipment	83.38	8.81	54.34	4.39
VOCs from paving and painting		20.14		
PM <sub>10</sub> from site preparation and demolition				8.09
<b>Total</b>	<b>83.38</b>	<b>28.95</b>	<b>54.34</b>	<b>12.48</b>
<b>Alternative 4</b>				
Construction equipment	121.23	12.78	78.64	6.38
VOCs from paving and painting		13.96		
PM <sub>10</sub> from site preparation and demolition				8.35
<b>Total</b>	<b>121.23</b>	<b>26.74</b>	<b>78.64</b>	<b>14.73</b>
<b>Alternative 5</b>				
Construction equipment	43.91	4.63	28.49	2.31
VOCs from paving and painting		18.26		
PM <sub>10</sub> from site preparation and demolition				7.26
<b>Total</b>	<b>78.36</b>	<b>11.35</b>	<b>51.06</b>	<b>5.09</b>
<b>Alternative 6</b>				
Construction equipment	121.23	12.78	78.64	6.38
VOCs from paving and painting		21.62		
PM <sub>10</sub> from site preparation and demolition				8.35
<b>Total</b>	<b>121.23</b>	<b>34.40</b>	<b>78.64</b>	<b>14.73</b>

Key:

CO = Carbon monoxide

NO<sub>x</sub> = Nitrogen oxide.

VOC = Volatile organic compound.

PM<sub>10</sub> = Particulate matter less than 10 microns in diameter.

tpy = Tons per year

**Table 6-15 P-8A MMA Emissions NAS Whidbey Island, All Alternatives**

Flight Operation	No. of Operations <sup>1</sup>	Baseline Emissions (tpy)				
		CO	NO <sub>x</sub>	HC	SO <sub>2</sub>	PM <sub>10</sub>
Alternative 1 (18 aircraft)						
Straight-In Arrival LTOs	1,339	11.3	20.1	1.2	1.8	0.6
Touch-and-Go	7,420	0.7	23.4	0.1	0.4	0.6
GCA Pattern	1,484	0.4	3.2	0.1	0.1	0.2
Maintenance Run-Ups		0.004	0.026	0.000	0.001	0.001
Total P-8A MMA Flight Ops Emissions		12.5	46.7	1.4	2.4	1.3
Baseline P-3C Emissions		53.9	59.2	33.7	3.1	27.7
Change in Aircraft Emissions		(-)41.4	(-)12.5	(-)32.4	(-)0.7	(-)26.3

**Table 6-15 P-8A MMA Emissions NAS Whidbey Island, All Alternatives (continued)**

Flight Operation		No. of Operations <sup>1</sup>	Baseline Emissions (tpy)				
			CO	NO <sub>x</sub>	HC	SO <sub>2</sub>	PM <sub>10</sub>
Change in POV Emissions			(-)13.5	(-)1.4	(-)1.4	0.0	(-)0.2
Total Change in Mobile Operations Emissions			(-)54.9	(-)13.9	(-)33.8	(-)0.7	(-)26.5
Alternative 2 (42 aircraft)							
Straight-In Arrival LTOs	3,214	27.2	48.1	2.8	4.4	1.4	
Touch-and-Go	17,808	1.7	56.2	0.3	1.0	1.4	
GCA Pattern	3,562	1.0	7.6	0.2	0.3	0.4	
Maintenance Run-Ups		0.009	0.061	0.001	0.002	0.002	
Total P-8A MMA Flight Ops Emissions		29.9	112.0	3.3	5.7	3.2	
Baseline P-3C Emissions		53.9	59.2	33.7	3.1	27.7	
Change in Aircraft Emissions		(-)24.0	52.9	(-)30.4	2.7	(-)24.5	
Change in POV Emissions		8.2	0.8	0.9	0.0	0.1	
Total Change in Mobile Operations Emissions		(-)15.8	53.7	(-)29.5	2.7	(-)24.4	
Alternative 3 (30 Aircraft)							
Straight-In Arrival LTOs	2,142	18.1	32.1	1.9	2.9	0.9	
Touch-and-Go	11,872	1.1	37.5	0.2	0.7	0.9	
GCA Pattern	4,215	1.1	9.0	0.3	0.4	0.5	
Maintenance Run-Ups		0.006	0.044	0.000	0.002	0.001	
Total P-8A MMA Flight Ops Emissions		20.4	78.6	2.3	4.0	2.4	
Baseline P-3C Emissions		53.9	59.2	33.7	3.1	27.7	
Change in Aircraft Emissions		(-)33.9	15.5	(-)31.5	0.8	(-)25.5	
Change in POV Emissions		(-)0.8	(-)0.1	(-)0.1	0.0	0.0	
Total Change in Mobile Operations Emissions		(-)34.7	15.4	(-)31.6	0.8	(-)25.5	
Alternative 4 (42 aircraft)							
Straight-In Arrival LTOs	3,193	27.0	47.8	2.8	4.3	1.4	
Touch-and-Go	18,280	1.8	57.7	0.3	1.1	1.4	
GCA Pattern	3,656	1.0	7.8	0.2	0.3	0.5	
Maintenance Run-Ups		0.009	0.061	0.001	0.002	0.002	
Total P-8A MMA Flight Ops Emissions		29.8	113.4	3.3	5.7	3.3	
Baseline P-3C Emissions		53.9	59.2	33.7	3.1	27.7	
Change in Aircraft Emissions		(-)24.1	54.2	(-)30.4	2.7	(-)24.4	
Change in POV Emissions		6.1	0.6	0.6	0.0	0.1	
Total Change in Mobile Operations Emissions		(-)18.0	54.8	(-)29.8	2.7	(-)24.3	
Alternative 5 (24 aircraft)							
Straight-In Arrival LTOs	1,741	14.7	26.1	1.5	2.4	0.7	
Touch-and-Go	9,646	0.9	30.5	0.1	0.6	0.8	
GCA Pattern	1,929	0.5	4.1	0.1	0.2	0.2	
Maintenance Run-Ups		0.005	0.061	0.001	0.002	0.002	
Total P-8A MMA Flight Ops Emissions		16.2	60.7	1.8	3.1	1.7	
Baseline P-3C Emissions		53.9	59.2	33.7	3.1	27.7	
Change in Aircraft Emissions		(-)37.7	1.5	(-)31.9	0.0	(-)25.9	
Change in POV Emissions		(-)0.7	-0.8	0.0	(-)0.1	(-)0.1	
Total Change in Mobile Operations Emissions		(-)38.4	0.7	(-)31.9	0.0	(-)26.0	

**Table 6-15 P-8A MMA Emissions NAS Whidbey Island, All Alternatives (continued)**

Flight Operation	No. of Operations <sup>1</sup>	Baseline Emissions (tpy)				
		CO	NO <sub>x</sub>	HC	SO <sub>2</sub>	PM <sub>10</sub>
Alternative 6 (36 aircraft)						
Straight-In Arrival LTOs	2,792	23.6	41.8	2.4	3.8	1.2
Touch-and-Go	16,054	1.5	50.7	0.2	0.9	1.3
GCA Pattern	3,211	0.9	6.8	0.2	0.3	0.4
Maintenance Run-Ups		0.008	0.052	0.000	0.002	0.001
Total P-8A MMA Flight Ops Emissions		26.1	99.4	2.9	5.0	2.9
Baseline P-3C Emissions		53.9	59.2	33.7	3.1	27.7
Change in Aircraft Emissions		(-)27.8	40.2	(-)30.8	2.0	(-)24.8
Change in POV Emissions		(-)0.02	(-)0.02	0.00	0.00	0.00
Total Change in Mobile Operations Emissions		(-)27.8	40.2	(-)30.8	2.0	(-)24.8

Note:

<sup>1</sup> Emissions calculated using emission factors from the International Civil Aviation Organization July 2007 and the California Air Resources Board March 27, 2007 (see Appendix H).

Key:

CO = Carbon monoxide.  
 HC = Hydrocarbons.  
 LTO = Landing-takeoff cycle.  
 NO<sub>x</sub> = Nitrogen oxides.  
 PM<sub>10</sub> = Particulate matter less than 10 microns in diameter.  
 POVs = Privately owned vehicles.  
 tpy = Tons per year.  
 VOCs = Volatile organic compounds.

Emissions of P-8A MMA flight operations and maintenance operations are based upon emission indexes developed by the International Civil Aviation Organization (ICAO) for the CFM56-7B26 engine, which would be used in the P-8A MMA aircraft (International Civil Aviation Organization July 2007). Time-in-mode assumptions for landing-takeoff cycles (LTOs) are taken from the FAA's Emissions and Dispersion Modeling System (EDMS) (June 29, 2007), which provides default time-in-mode values for the Boeing 737-800 series aircraft. These values were used to provide emission data because P-8A MMA data from the Aircraft Environmental Support Office (AESO) are not available at this time (see Appendix H for emission calculations). Time-in-mode assumptions for touch-and-go and GCA box operations are adapted from P-3C time-in-mode assumptions from the AESO (Aircraft Environmental Support Office April 2000). Emissions from POVs were estimated based on the California Air Resources Board's Emission Factors Model (EMFAC) 2007—which provides conservative emission values for vehicle emissions—and on changes in personnel estimates (California Air Resources Board March 27, 2007). These are summarized in Table 6-15.

### 6.4.3 Air Quality Impacts

Total annual emissions from construction and operations for each alternative are summarized in Tables 6-14 and 6-15. Because NAS Whidbey Island is located in regions that are in attainment for all criteria emissions, the Conformity Rule does not apply to the implementation of this action at NAS Whidbey Island. Prevention of Significant Deterioration (PSD) standards establish 250 tpy thresholds for criteria pollutants for major stationary emissions sources, and although mobile and temporary emissions are not subject to these standards, they provide an adequate threshold to evaluate the significance of an action. Both temporary construction total annual emissions and projected annual operating emissions are below 250 tpy for all criteria pollutants. Under the No Action Alternative, operations of the P-3C and staff levels would remain the same as baseline conditions, resulting in no change in emission totals or air quality conditions.

## 6.5 Socioeconomics

### 6.5.1 Population and Housing

#### 6.5.1.1 Population: Alternatives 1 through 6

Depending on the alternative selected, the number of personnel stationed at the base could increase or decrease. Table 6-16 shows the projected personnel loading at NAS Whidbey Island under each of the alternatives. These numbers include both the estimated number of military and civilian personnel and dependents (Note: only military personnel were included in the personnel tables in Section 2).

**Table 6-16 Projected Change in Regional Population<sup>1</sup> Resulting from P-8A MMA Personnel Transition to NAS Whidbey Island**

	<b>Alternative 1</b>	<b>Alternative 2</b>	<b>Alternative 3</b>	<b>Alternative 4</b>	<b>Alternative 5</b>	<b>Alternative 6</b>
<b>NAS Whidbey Island/Island County</b>						
Island County 2010 Projected Population	80,650	80,650	80,650	80,650	80,650	80,650
P-8A MMA Personnel						
Military	(-)753	54	(-)277	(-)167	(-)484	(-)374
Civilian and Contractor	145	317	241	440	166	365
<b>Total P-8A MMA Personnel</b>	<b>(-)608</b>	<b>371</b>	<b>(-)36</b>	<b>273</b>	<b>(-)318</b>	<b>(-)9</b>



**Table 6-16 Projected Change in Regional Population<sup>1</sup> Resulting from P-8A MMA Personnel Transition to NAS Whidbey Island**

	<b>Alternative 1</b>	<b>Alternative 2</b>	<b>Alternative 3</b>	<b>Alternative 4</b>	<b>Alternative 5</b>	<b>Alternative 6</b>
Dependents						
Military Dependents	(-)1,486	209	(-)486	(-)254	(-)927	(-)694
Civilian/Contractor Dependents	313	685	521	950	251	788
<b>Total Dependents</b>	<b>(-)1,173</b>	<b>894</b>	<b>35</b>	<b>696</b>	<b>(-)676</b>	<b>94</b>
<b>Total Population Gain/(Loss)</b>	<b>(-)1,781</b>	<b>1,265</b>	<b>(-)1</b>	<b>969</b>	<b>(-)994</b>	<b>85</b>
<b>Population Gain/(Loss) as a Percent of 2010 Island County Population</b>	<b>(-)2.2%</b>	<b>1.6%</b>	<b>&lt;(-)0.1%</b>	<b>1.2%</b>	<b>(-)1.2%</b>	<b>0.1%</b>

Note:

<sup>1</sup> Projected changes specific to Island County.

Fewer military personnel per P-8A MMA squadron are needed than per P-3C squadron because fewer crew members per aircraft would be needed and fewer support personnel would maintain and service the aircraft. Contractor support personnel would provide basic maintenance, preventive maintenance, inspections, servicing/replacement of various aircraft components, and specialized repair of inoperative components.

Depending on the net changes in personnel for each alternative, it is assumed that military personnel and their dependents (e.g., spouses and children) would either move to or leave the region. If the latter, it is assumed that these personnel and dependents would be reassigned to other installations within the Navy. The number of military dependents affected by the proposed action was calculated using a national Navy/Marine Corps average for the percentage of married enlisted personnel and officers, by rank, and the average number of children by their parents' rank (*Facility Planning Criteria for Navy and Marine Corps Shore Installations*, NAVFAC P-80). These average percentages were applied to the number of enlisted personnel and officers who would be relocating under each of the alternatives to determine the corresponding number of dependents who would be affected (see Table 6-16).

The number of non-military dependents (e.g., dependents of civilians and contractors employed by NAS Whidbey Island) who would be affected by the proposed action was calculated using the average family size for Island County according to the 2005 American Community Survey (U.S. Census Bureau 2005). The average family size in Island County was 3.16; one person (the civilian or contractor) was subtracted from that number, producing an average of

2.16 dependents per civilian/contractor personnel. This average was then applied to the number of contractors and civilians who would be assumed to relocate to determine the corresponding number of dependents who would be affected by the various alternatives (see Table 6-16).

The total population changes under the different alternative scenarios range from a loss of 2.2% under Alternative 1 to a gain of 1.6% under Alternative 2. These are conservative estimates because only approximately 85% of the personnel stationed or employed at NAS Whidbey Island reside in Island County. In addition, a portion of the changes in personnel in all alternatives are military personnel, many of whom live on-station and would not directly affect the local population count. Thus, none of these changes in population would have a significant impact on the total population numbers of Island County. In addition, the population impacts are believed to be conservative in comparison with the estimated 2010 population numbers for the local municipality. The personnel and squadron transition would actually occur sometime after 2010 and be implemented as a rolling transfer. Thus, there would be no sudden change in the local population but, rather, a gradual adjustment over several years. This combination of factors would minimize any impacts associated with the personnel transitioning.

#### **6.5.1.2 Housing: Alternatives 1 through 6**

Due to the relatively small change in the overall population of Island County associated with any of the proposed alternatives (see Section 6.5.1.1), the housing market is not anticipated to be significantly affected. Alternatives 1, 3, and 5 result in a slight loss of local population, and the balance of the alternatives result in a slight increase. Neither scenario would cause significant changes in the local housing market.

Existing housing vacancy rates are more than 14% in the area (many houses are seasonal and vacation homes) and Oak Harbor has a history of housing military personnel and civilians/contractors employed by the base. A component of this change in personnel is the military and their dependents, many of whom currently reside in Navy family housing or bachelor quarters. Thus it is not anticipated that the local housing market would be significantly affected.

### **6.5.1.3 No Action Alternative**

Under the No Action Alternative, the P-8A MMA would not replace the P-3C and no change in personnel would take place. The existing base and regional population would not be directly impacted by the Navy action under the No Action Alternative.

### **6.5.2 Economy**

The proposed action would affect the regional economy in two ways. First, under all alternatives, there would be a short-term, positive effect as funds are injected into the regional economy through expenditures on new construction and renovation projects required to support the P-8A MMA squadrons. However, there would also be a long-term impact (either negative or positive, depending on the alternative) on the regional economy, primarily attributable to the changes in payroll and other station expenditures supporting businesses and services within the NAS Whidbey Island region. Although the one-time construction expenditures are often large sums, they are not considered as significant as the annual gain or loss in payroll and other station expenditures associated with the transitioning of the P-3C and P-8A MMA squadrons.

In order to quantify the total impact of the proposed alternatives on the regional economy, the Navy used regional input-output modeling system (RIMS II) multipliers. These multipliers are based on regional information derived from databases analyzing commercial, industrial, and household spending patterns and relationships and are specific to the area around NAS Whidbey Island. These multipliers also estimate the potential number of jobs created or lost as a result of changes in earning and spending patterns.

The economic impacts can be categorized as either one-time, short-term impacts related to construction activities or annual, long-term operational impacts.

### **Short-Term Construction-Related Impacts**

Transitioning from the P-3C to the P-8A MMA would require upgrading, renovating, or constructing new facilities at NAS Whidbey Island to accommodate the aircraft squadrons, personnel, and contractors. Table 6-17 lists the construction costs under the alternative scenarios at NAS Whidbey Island. Major cost components under all alternatives include such items as a new P-8A MMA hangar, ranging in cost from \$85 million to \$191 million, which would include an Integrated Training Center under Alternatives 4 and 6 and a Fleet Training Center under Alterna-

tives 1, 2, 3, and 5. Another component of construction costs unique to NAS Whidbey Island would be for potential wetland mitigation, which could range from \$1 million to more than \$4 million, depending on the alternative selected.

**Table 6-17 Cost of Construction at NAS Whidbey Island (FY 2011 dollars)**

<b>Construction Component</b>	<b>Alternative 1</b>	<b>Alternative 2</b>	<b>Alternative 3</b>	<b>Alternative 4</b>	<b>Alternative 5</b>	<b>Alternative 6</b>
Tactical Support Center/Mobile Operations Control Center/Wing HQ	\$16,897,306	\$17,801,948	\$17,801,948	\$17,801,948	\$17,801,948	\$17,801,948
P-8A MMA Hangar	\$85,687,077	\$175,511,612	\$138,619,191	\$191,177,873	\$106,512,936	\$169,971,193
Fleet Training Center	*	*	*	-	*	-
Integrated Training Center	-	-	-	*	-	*
Contractor Logistics Support	*	*	*	*	*	*
Aircraft Parking Apron	\$4,761,674	\$35,934,527	\$13,922,523	\$35,934,527	\$4,761,674	\$26,605,295
Aircraft Rinse Facility	\$323,130	\$323,130	\$323,130	\$323,130	\$323,130	\$323,130
Compass Calibration Pad	\$86,416	\$86,416	\$86,416	\$86,416	\$86,416	\$86,416
Replace a portion of existing Building 2704	\$713,033	\$713,033	\$713,033	\$713,033	\$713,033	\$713,033
Replace Buildings 2621, 2621A, 2666, 2707, 2786, and 2800	-	\$3,970,933	\$3,970,933	\$3,970,933	-	\$3,970,933
Wetlands Mitigation	-	\$4,144,890	\$1,018,043	\$4,144,890	-	\$2,818,664
Ordnance Storage	-	\$3,347,342	\$1,489,322	\$3,347,342	-	\$1,489,322
Inert Ordnance Storage	-	\$1,291,154	-	\$1,291,154	-	-
<b>Total Construction Costs</b>	<b>\$108,468,636</b>	<b>\$243,124,984</b>	<b>\$177,944,539</b>	<b>\$258,791,246</b>	<b>\$130,199,137</b>	<b>\$223,779,934</b>

Note:

\* Co-located with P-8A MMA Hangar; costs combined under P-8A MMA Hangar.

The specific years of construction would vary, depending on the actual alternative and transition scenario chosen. Construction activities would generate a number of jobs during the construction period and would contribute to local earnings and indirect spending. The proposed construction projects would generate between 1,703 and 4,062 jobs and spending, depending on the alternative chosen. Table 6-18 presents the multiplicative economic impacts of construction spending and an estimate of jobs created through this increase in spending.

**Table 6-18 Regional Economic Impact Resulting from Proposed Renovation and Construction Projects (One-Time Costs) at NAS Whidbey Island (FY 2011 dollars)**

	<b>Alternative 1</b>	<b>Alternative 2</b>	<b>Alternative 3</b>	<b>Alternative 4</b>	<b>Alternative 5</b>	<b>Alternative 6</b>
<b>Direct Economic Impacts</b>						
Expenditures (\$ million)	\$108.5	\$243.1	\$177.9	\$258.8	\$130.2	\$223.8
<b>Multiplied Economic Impacts</b>						
Expenditures (\$ million)	\$234.2	\$525.0	\$384.3	\$558.8	\$281.2	\$483.2
<b>Total Economic Impacts</b>						
Expenditures (\$ million)	<b>\$342.7</b>	<b>\$768.1</b>	<b>\$562.2</b>	<b>\$817.6</b>	<b>\$411.4</b>	<b>\$707.0</b>
<b>Employment Impacts (does not include MMA personnel)</b>						
Employment (jobs)	1,703	3,816	2,793	4,062	2,044	3,512

Because these construction dollars represent a one-time expenditure, the resulting positive economic impacts would last only a short time. Once these funds leave the regional economy through savings, taxes, or purchases of goods and services outside the region, the positive effects would no longer be multiplied.

### **Long-Term Earnings-Related Impacts**

Transitioning from the P-3C to the P-8A MMA aircraft would require a different set of personnel to operate and maintain the aircraft and provide necessary support services. Table 6-19 summarizes the changes in employment and payroll at NAS Whidbey Island under each of the alternative scenarios and the estimated regional economic impact that would result from the change (gain or loss) in annual or recurring spending of disposable income. Depending on the alternative chosen, personnel and payroll at NAS Whidbey Island could increase or decrease. Although military personnel typically have a slightly different spending pattern than civilians and contractors because programs/benefits offered by the military (i.e., housing, base exchange, health care, etc.) are available, in this analysis spending by civilians and military were combined.

Payroll expenditures were calculated for all personnel relocating from the area or transitioning into the area under each of the alternatives. The change in direct payroll expenditures for personnel stationed or employed at NAS Whidbey Island is shown in Table 6-19. The change in annual earned income of personnel employed by the base would range from a loss of \$40.2 million (Alternative 1) to a gain of \$46.4 million (Alternative 2).

**Table 6-19 Regional Economic Impact (Annual) Resulting from Projected Change in Employment and Disposable Income at NAS Whidbey Island (FY 2011 dollars)**

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6
<b>Direct Impacts</b>						
Employment (jobs)	(-)608	371	(-)36	273	(-)318	(-)9
Earnings (\$ million)	(-) \$40.2	\$46.4	\$10.6 <sup>1</sup>	\$32.4	(-) \$14.8	\$7.0 <sup>1</sup>
<b>Multiplied Impacts</b>						
Employment (jobs)	(-)317	367	84	256	(-)117	56
Earnings (\$ million)	(-) \$38.1	\$49.0	\$10.0	\$30.8	(-) \$14.0	\$6.7
<b>Total Impacts</b>						
Employment (jobs)	(-)925	738	48	529	(-)435	47
Earnings (\$ million)	(-) \$78.3	\$90.4	\$20.6	\$63.2	(-) \$28.8	\$13.7

Note:

<sup>1</sup> The net positive payroll/earnings changes with an overall loss of personnel are due to an overall change to higher-ranked personnel who earn more individually.

This change in personnel employed by NAS Whidbey Island would result in an annual change in personal income earned by residents in the region, residents who subsequently spend a portion of their disposable income in the local community. The total, multiplied effect of the loss in earned income is also presented in Table 6-19. These impacts were calculated using RIMS II multipliers for average household spending in the region, based on disposable income (30% of payroll expenditures are assumed to be spent on taxes and savings).

The regional economic impact of the change in personnel and payroll expenditures at NAS Whidbey Island could be positive or negative. Alternative 1 would be a negative scenario, with a combined loss of direct and indirect jobs of 925 and a total loss of earnings in the region of more than \$78 million. Total personal income earned in 2005 for Island County was \$2.5 billion (U.S. Department of Commerce, Bureau of Economic Analysis August 7, 2007). In 2011 dollars this would be approximately \$2.9 billion; thus, the loss of personal income resulting from Alternative 1 would represent approximately 2.7% of the total personal income earned in Island County. Under Alternative 2, which would represent the largest positive economic impact, there would be an annual increase of \$90.4 million of personal income, representing an approximate increase of 3.1% from the current Island County total.

Under all alternatives, there would be a positive economic impact related to the construction spending to prepare NAS Whidbey Island for the transition to the P-8A MMA aircraft. However, under Alternative 1, the annual reduction in earnings from the loss in jobs would eventually outweigh the positive effects of the construction. Alternatives 2, 3, and 4 would have the

benefit of both the positive impact of construction costs and an increase in personnel, with the associated increase in payroll. Overall, Alternative 1 would have a negative economic impact, and Alternative 2 would have the greatest positive economic impact. Alternative 4 has a higher construction impact but lower annual benefits.

### **No Action Alternative**

Under the No Action Alternative, there would be no transition from the P-3C to the P-8A MMA aircraft and, thus, no change in personnel would occur. The base payroll would remain as it is now and there would be no impact on the disposable income available in the local region as a result of the proposed action.

### **6.5.3 Taxes and Revenues**

Under the alternatives at NAS Whidbey Island in this proposed action, the number of personnel can either increase or decrease. It is also assumed that under these changes all associated households relocate either to or from the area. Relocation (either into the area or out of the area) of households is likely to result in a change in tax revenues for the local municipalities. The majority of the personnel at NAS Whidbey Island live in Island County.

As indicated under the potential impact of the population loss (Section 6.5.1), the change in base personnel could result in an increase of 1.6% or a decrease of up to 2.2% in the total Island County population. This increase or decrease could have an impact on the amount of tax revenue generated and collected by the municipality. Based on the size of the percentage change and the historic and projected growth of the region, it is anticipated that any loss of taxes from a decrease in personnel would be minimal and quickly negated through general population growth in the area around NAS Whidbey Island. In addition, the personnel change at NAS Whidbey Island would typically consist of an increase in civilian and contractor personnel (who reside in the local community) and a decrease in military personnel (some of whom live on base). This would further reduce the overall potential loss in tax revenue impacts. Otherwise, alternatives with an increase in personnel would only add to the local tax base and benefit the community. Either positive or negative, this impact is assumed to be negligible under any alternative.

## 6.5.4 Education

### 6.5.4.1 Alternatives 1 through 6

The projected change in personnel stationed or employed by NAS Whidbey Island under each of the proposed alternatives would result in corresponding changes in the number of school-aged children in the area because these families are assumed to relocate either to or from the area. The number of personnel and their school-aged children would decrease slightly under Alternative 1. The balance of the alternatives would all result in an increase of 45 to 247 school-aged children. In many cases, as shown in Table 6-20, the slight decrease in the military personnel (and their dependents) is offset by an increase in civilian and contractor personnel (and their dependents), creating a net gain.

**Table 6-20 Projected Change in Number of School-Aged Children Resulting from P-8A MMA Personnel Transition at NAS Whidbey Island**

	<b>Alternative 1</b>	<b>Alternative 2</b>	<b>Alternative 3</b>	<b>Alternative 4</b>	<b>Alternative 5</b>	<b>Alternative 6</b>
Military Personnel	(-)753	54	(-)277	(-)167	(-)484	(-)374
School-Aged Military Dependents	(-)309	94	(-)71	(-)15	(-)179	(-)122
Civilian and Contractor Personnel	145	317	241	440	166	365
School-Aged Non-Military Dependents	70	153	116	212	56	176
<b>Total School-Aged Children</b>	<b>(-)239 (-)4.3%</b>	<b>247 4.4 %</b>	<b>45 0.8%</b>	<b>197 3.5%</b>	<b>(-)123 (-)2.2%</b>	<b>54 1%</b>

The projected change in the number of school-aged children in the area would have a minimal impact on enrollment within the local school districts. The greatest change from the existing number of students occurs under Alternative 2, where there would be an increase of 247 school-aged children. Based on the size of the school district (5,600 students as of the 2006-2007 school year), the percentage change in the school district enrollment would be a 4.4% increase<sup>1</sup>.

The gain or loss of enrolled students from the school-aged military dependents would be concentrated in specific schools that have a history of high enrollment from NAS Whidbey Is-

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<sup>1</sup> The greatest change under any alternative is an increase of 247 (Table 6-20, Alternative 2) divided by 5,600 total enrollment, which equals 4.4%.



land. One elementary school was closed in spring 2007 and it is assumed that there is adequate capacity to absorb any projected changes in overall enrollment. The impact on specific schools is difficult to determine, but it is anticipated that the impact on the school district would not be significant. Minor adjustments in the schools that children attend could address potential capacity issues at individual schools.

The potential change in “federally connected students” attending the district schools would result in an increase or decrease in corresponding federal impact aid received by the district. This change in aid is not expected to have a significant fiscal impact because federal impact aid typically does not cover the full per-pupil costs received by the district, and it is estimated that more than half of the entire school enrollment is military-dependent.

#### **6.5.4.2 No Action Alternative**

Under the No Action Alternative, the P-8A MMA would not replace the P-3C and no change in required personnel would take place. Base personnel numbers would remain as they are now and there would be no associated change in the dependents of military or contractor/civilian personnel. There would be no impact on education from this alternative.

#### **6.5.5 Impacts on Minority and Low-Income Populations and Environmental Health and Safety Risks to Children**

Consistent with Executive Orders 12898 and 13045, and as discussed in Section 5.5.5, the Navy’s policy is to identify disproportionately high and adverse human health or environmental effects of its actions on minority and low-income populations and the environmental health risks and safety effects on children. This analysis focuses on the potential for minority and low-income populations and children to be exposed to the projected aircraft noise associated with the alternatives. The alternative selected for this analysis is that which would result in the largest number of individuals exposed to the greater-than-65 dB DNL noise contour, which at NAS Whidbey Island would be Alternative 4 with five fleet squadrons and the proposed FRS. Although the analysis examines only the potential effects associated with this alternative, the results would be similar to any of the other alternatives evaluated in this EIS for NAS Whidbey Island. Thus, this analysis represents the most conservative risk for potential environmental justice and environmental health and safety impacts.

Tables 6-21, 6-22, and 6-23 provide demographic and economic data for all census tracts that are wholly or partially within the greater-than-65 dB DNL noise contours under Alternative 4. These demographic and economic data were compared with similar demographic and economic data for the communities of Island County and the state of Washington (see Section 5.5.5) to determine whether the proposed action would have disproportionately high and adverse effects on minority and low-income populations or pose environmental health or safety risks to children. Where the minority and low-income populations or number of children within the identified affected area exceeds 50%, or the percentage of minority or low-income populations or children exceeds the comparable percentage of these populations in the community of comparison (i.e., the city or county), the population exposed is considered to receive a disproportionately high and adverse effect or to sustain environmental health or safety risks.

**Table 6-21 Total Persons by Race and Hispanic Origin for all 2000 Census Tracts within or Partially within the Greater-than-65 dB DNL Noise Zone at NAS Whidbey Island under Alternative 4 (5 Fleet Squadrons and FRS)**

<b>Census Tract<sup>a</sup></b>	<b>Total Persons</b>	<b>Percent Hispanic</b>	<b>Percent Minority</b>
950200	4,349	1.4%	4.6%
952100	3,114	10.3%	13.1%
952700	3,338	5.7%	10.4%
970100	3,783	5.3%	11.0%
970300	3,483	2.7%	9.8%
970400	4,727	6.2%	25.4%
970601	3,487	5.5%	28.4%
970700	1,954	5.6%	22.4%
970800	2,757	4.6%	18.6%
971000	4,411	3.1%	8.7%
971100	2,704	4.7%	7.2%
971300	3,697	1.8%	3.3%
<b>Island County</b>	<b>71,558</b>	<b>4.1%</b>	<b>12.9%</b>
State of Washington	5,894,121	7.5%	18.3%

Notes:

Shaded numbers represent those census tracts having a higher percentage of minority population than the community of comparison.

<sup>a</sup> Does not include NAS Whidbey Island Census Tract.

**Table 6-22 Percent of Population Considered Low Income in Each 2000 Census Tract Within or Partially Within the Greater-than-65 dB DNL Noise Zone at NAS Whidbey Island under Alternative 4 (5 Fleet Squadrons and FRS)**

Census Tract <sup>a</sup>	Total Population	Percent Considered Low-Income (Below Poverty)
950200	4,349	4.7%
952100	3,114	4.4%
952700	3,338	6.0%
970100	3,783	7.1%
970300	3,483	7.7%
970400	4,727	10.6%
970601	3,487	10.6%
970700	1,954	12.1%
970800	2,757	7.4%
971000	4,411	6.4%
971100	2,704	2.7%
971300	3,697	5.9%
<b>Island County</b>	<b>71,558</b>	<b>7.0%</b>
State of Washington	5,894,121	10.6%

Source: U.S. Bureau of the Census 2000.

Notes:

Shaded numbers indicate census tracts with a higher percentage of low-income households than the community of comparison.

<sup>a</sup> Does not include NAS Whidbey Island Census Tract.

**Table 6-23 Percent of Population Considered Children in Each 2000 Census Tract Within or Partially Within the Greater-than-65 dB DNL Noise Zone at NAS Whidbey Island under Alternative 4 (5 Fleet Squadrons and FRS)**

Census Tract <sup>a</sup>	Population	Percent Considered Children (Under 18 years of age)
950200	4,349	21.6%
952100	3,114	24.0%
952700	3,338	26.4%
970100	3,783	25.7%
970300	3,483	21.3%
970400	4,727	31.5%
970601	3,487	27.3%
970700 <sup>b</sup>	1,954	57.8%
970800	2,757	26.1%
971000	4,411	22.5%
971100	2,704	20.7%
971300	3,697	17.6%
<b>Island County</b>	<b>71,558</b>	<b>25.4%</b>
State of Washington	5,894,121	25.6%

Source: U.S. Bureau of the Census 2000.

Notes:

Shaded numbers indicate census tracts with a higher percentage of children than the community of comparison.

<sup>a</sup> Does not include NAS Whidbey Island Census Tract.

<sup>b</sup> Census tracts in which the youth population exceeds 50%.

#### **6.5.5.1 Minority Populations**

Minority populations are defined by Executive Order 12898 as individuals who are Black/African-American (not of Hispanic origin), Asian or Pacific Islander, American Indian or Alaskan Native, or Hispanic. As shown in Table 6-21 (see also Section 5.5.6), in 2000 these combined minority populations in Island County and the state of Washington comprised 12.9% and 18.3% of the populations, respectively. Figure 6-8 shows the location of census tracts in the vicinity of NAS Whidbey Island and their relationship to the modeled projected 2019 noise contours under Alternative 4.

The 65 dB DNL noise contour for Alternative 4 at NAS Whidbey Island shows that twelve census tracts are partially or wholly within the noise zone. Of these, eight show either a higher percent minority and/or percent Hispanic population than reside in Island County, the community of comparison. Thus, there is a potential for a disproportionately high and adverse environmental and human health impact on this minority and/or Hispanic population. Further review shows that these census tracts are currently within the greater-than-65 dB DNL noise contour under baseline environmental conditions. In other words, there would be no difference between baseline and future noise conditions with implementation of the proposed action.

#### **6.5.5.2 Low-Income Populations**

The Council on Environmental Quality (1997) defines low-income populations as populations considered by the U.S. Census Bureau to be “below poverty level.” The number of individuals below poverty level was obtained for each census tract that was wholly or partially within the greater-than-65 dB DNL noise contour under Alternative 4 at NAS Whidbey Island. Table 6-22 presents the low-income statistics for the census tracts identified in Figure 6-8.

Of the twelve census tracts that are partially or wholly within the noise zone, six have a higher percentage of low-income population when compared with the Island County population, the community of comparison. Thus, there is a potential for a disproportionately high and adverse environmental and human health impact on this low-income population. However, comparison of the baseline and projected 65 dB DNL noise contours shows that these census tracts are also within the baseline environment 65 dB DNL noise contour, so there would be no difference between baseline and future noise conditions if the proposed action were implemented.

### **6.5.5.3 Children**

For the purposes of this analysis, children were defined as those individuals under the age of 18 years. These statistics were obtained using 2000 U.S. Census data for each census tract that was wholly or partially within the greater-than-65 dB DNL noise contour under Alternative 4 at NAS Whidbey Island. Figure 6-8 shows the impacted census tracts and Table 6-23 presents the statistics for each census tract.

Of the twelve census tracts that are partially or wholly within the noise zone, six have a higher percentage of individuals under the age of 18 when compared with the population of Island County, the community of comparison. Thus, there is a potential for a disproportionately high and adverse impact and environmental health risk and safety effect on children. However, further review shows that these census tracts are currently within the greater-than-65 dB DNL noise contour in the baseline environment, so there would be no difference between baseline and future noise conditions if the proposed action were implemented.

## **6.6 Infrastructure and Utilities**

As noted in Section 5, infrastructure and utilities would not be affected by the proposed action and so are not discussed in this EIS.

## **6.7 Community Services**

As noted in Section 5, community services would not be affected by the proposed action and so are not discussed in this EIS.

## **6.8 Transportation**

As noted in Section 5, transportation would not be affected by the proposed action and so is not discussed in this EIS.

## **6.9 Topography and Soils**

Soils underlying portions of Construction Area No. 1 are characterized by poor drainage and are ponded for part of the year, making them unsuitable for construction. New construction in this area would require fill material to be placed over existing soils. The area requiring fill would be less than approximately 0.2 acres under Alternatives 1 and 5; 2.4 acres under Altern-

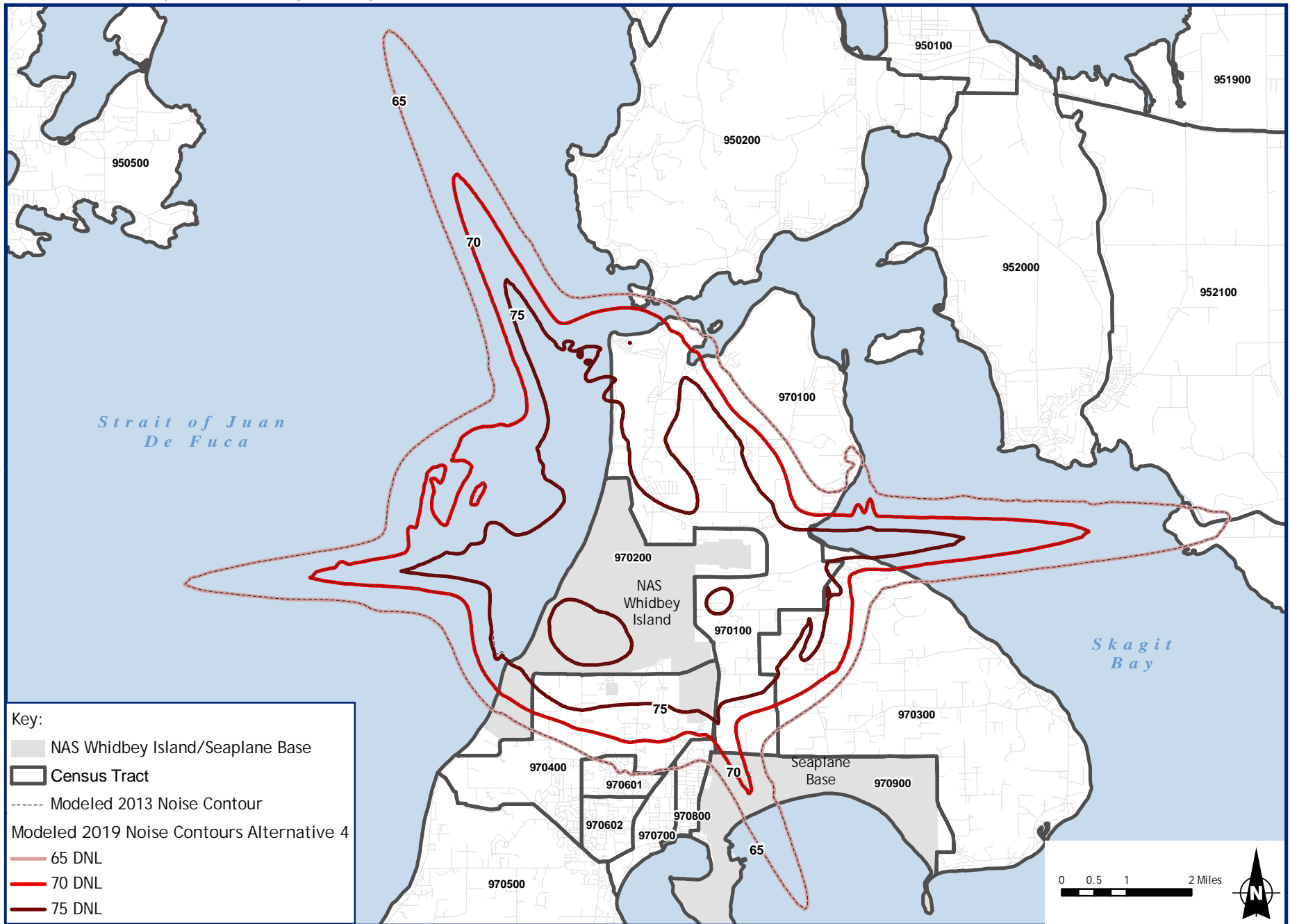


Figure 6-8  
 2000 Census Tracts Wholly or Partially within Modeled 2013 DNL Noise Contours  
 and 2019 DNL Noise Contours Projected Under Alternative 4  
 NAS Whidbey Island, Washington

ative 3; 2.1 acres under Alternative 6; and approximately 6.7 acres under Alternatives 2 and 4. Placement of the fill material would have a minor effect on topography at NAS Whidbey Island because surface elevations would increase by only an estimated 1 to 2 feet. Topography at Construction Areas Nos. 2 and 3 at NAS Whidbey Island would not be affected because the sites are generally level, and no significant filling or grading would be required.

Soils at the proposed construction sites would be temporarily affected by the proposed action. Impacts would include a potential for soil erosion during construction activities caused by compaction and rutting from vehicle traffic. Because of the nature of the underlying soils, impacts from these practices would be most likely to occur in Construction Area No. 1. The projected increase in impervious surface from approximately 6 acres under Alternatives 1 and 5 to 32 acres under Alternatives 2 and 4 would increase the quantity and velocity of storm water runoff, which would increase the susceptibility of surrounding soils to erosion. These impacts would be minimized or avoided by using standard soil erosion- and sedimentation-control techniques at the construction sites, such as silt barriers (filter fabric), and appropriate revegetation techniques upon completion. Revegetation techniques would include replanting disturbed areas with native plants and specific seed mixtures approved through the Natural Resource Conservation Service (NRCS). Consequently, potential impacts on soils at NAS Whidbey Island would be minor and temporary.

Under the No Action Alternative no additional facilities would be constructed to support the current operations of P-3C aircraft; therefore, topography and soils would not be affected.

## **6.10 Water Resources and Wetlands**

### **6.10.1 Surface Water**

No naturally occurring waterbodies would be directly affected by the proposed action at NAS Whidbey Island. Construction of new facilities in Construction Area No. 1 under all alternatives would disturb a maintained drainage ditch that bisects the area (see Figure 5-7 in Section 5, Existing Environment: NAS Whidbey Island). Under Alternatives 2, 3, and 4, in addition to the drainage ditch previously mentioned, a second drainage feature at the southern end of the construction area would be disturbed. These artificial drainage features would have to be relocated to support the new construction. The Navy would incorporate a drainage system in pro-

posed Construction Area No. 1 to manage the flow of storm water to Dugwalla Bay and other measures as required under a Clean Water Act (CWA) Section 404 permit for the proposed activity.

### **6.10.2 Water Quality**

Water quality for the eastern Straits of Juan Fuca in the area of Ault Field is considered good. According to the 2004 CWA 303d list for Washington State, no impaired water bodies are listed on or near Ault Field (Miller January 2007).

Construction of the facilities to support basing P-8A MMA at NAS Whidbey Island would disturb approximately 12.0 acres under Alternative 1; 44.7 acres under Alternative 2; 24.0 acres under Alternative 3; 44.9 acres under Alternative 4; 2.6 acres under Alternative 5; and 34.0 acres under Alternative 6. Storm water runoff from the construction sites could potentially impact water quality in either the Strait of Juan de Fuca or Dugwalla Bay through the introduction of sediments, particulates, and various toxins. Because more than 1 acre would be disturbed during construction under all alternatives, a construction National Pollutant Discharge Elimination System (NPDES) storm water permit would be obtained from the Washington State Department of Ecology through their water quality permit program. Under the permit, the Navy (NAS Whidbey Island) would submit a site-specific Storm Water Management Plan for new discharges that would include a site plan for managing storm water runoff and describe the best management practices (BMPs) to be implemented to eliminate or reduce erosion, sedimentation, and storm water pollution. Examples of storm water BMPs that may be used include:

- **Grass swales.** Temporary or permanent features designed to filter and reduce storm water runoff from construction areas;
- **Silt fencing.** A temporary erosion and sediment control used to prevent dirt from entering waterways before bare soil is stabilized with vegetation; and
- **Berms.** A temporary erosion and sediment control that physically prevents polluted runoff from entering nearby storm drain inlets and waters.

With proper implementation of the Storm Water Management Plan, impacts on water quality from erosion and off-site sedimentation during construction would be minor.

Impervious surfaces cover approximately 600 acres (14%) of Ault Field. New construction would create approximately 5.6 acres of new impervious surface under Alternative 5; 5.6



acres under Alternative 1; 11.8 acres under Alternative 3; 21.6 acres under Alternative 6; 32.5 acres under Alternative 4; and 32.6 acres under Alternative 2. Based on preliminary estimates, after removing the disused runway (8.14 acres), the new impervious surfaces would generate an additional 1.5 million gallons of runoff per year under Alternative 1; 1.7 million gallons of runoff per year under Alternative 5; 8.1 million gallons under Alternative 3; 18.7 million gallons under Alternative 6; and 25.6 million gallons under Alternative 2 and Alternative 4. Mitigation for storm water for all alternatives is summarized below and discussed in Appendix L.

The current NPDES permit for NAS Whidbey Island includes storm water quality requirements for storm water that may be discharged to either the Strait of Juan de Fuca or Dugualla Bay. With the increase in the amount of proposed impervious surface that would be added to the base under all replacement alternatives, it is expected that the additional storm water runoff from the proposed action would require a revision to the current NPDES permit.

Under the No Action Alternative no additional facilities would be constructed to support the current operations of P-3C aircraft; therefore, water quality would not be affected.

### **Storm Water Mitigation Measures**

The proposed infrastructure development would increase storm water runoff from Ault Field (Philip Williams & Associates 2008). However, the mitigation measures that would be implemented would maintain or decrease the quantity of storm water discharged to Dugualla Lagoon, compared with current discharge levels (Table 6-24; Philips Williams & Associates 2008). Storm water mitigation measures for addressing this storm water change under all alternatives include removing existing impervious surfaces on the base and adding a storm water detention basin under Alternatives 2, 3, 4, and 6.

### **Storm Water Mitigation for Alternatives 1 and 5**

Mitigation for Alternatives 1 and 5 consists of removing a portion of former runway located within the airfield (Figure 6-9). Storm water modeling illustrates that increases in flow from new impervious surfaces for Alternatives 1 and 5 would be offset by removing this unused impervious surface (Table 6-24). The total amount of impervious surface proposed for removal is 8.14 acres. Storm water modeling of the runway conservatively assumed that the northern

portion of the runway has an imperviousness of 50% and the southern portion of the runway has an imperviousness of 90% (Philip Williams & Associates 2008).

**Table 6-24 Storm Water Mitigation Results for All Alternatives Under the 100-Year Storm Model**

<b>Alternative</b>	<b>Area of Detention Basin (acres)</b>	<b>Increase in Flow (cfs)</b>	<b>Reduction due to Mitigation (cfs)</b>	<b>Changes to Flow with Mitigation (cfs)</b>
1	No basin needed	1.5	1.5	<b>0.0</b>
2	0.52	8.2	11.6	<b>(-)3.4</b>
3	0.28	3.3	7.7	<b>(-)4.4</b>
4	0.52	8.2	11.6	<b>(-)3.4</b>
5	No basin needed	1.5	1.5	<b>0.0</b>
6	0.33	5.2	8.9	<b>(-)3.7</b>

Notes:

Baseline flow = 151.7 cfs

All alternatives include the removal of 8.14 acres of unused runway.

Key:

cfs = cubic feet per second

### **Storm Water Mitigation for Alternatives 2, 3, 4, and 6**

Removal of the former runway site does not provide enough flow mitigation to offset proposed increases in impervious surface under these alternatives. For these alternatives, a detention basin would be necessary to fully mitigate the storm water impacts, in addition to removing the former runway (Figure 6-9). The Western Washington Hydrology Model was used to size detention basins for these alternatives (Philip Williams & Associates 2008).

The size of the detention basin varies for each alternative from approximately 0.28 acres to 0.52 acres (Table 6-24). In addition to the area needed for storm water detention, a 12-foot buffer is assumed around each basin for maintenance access or possible grading issues. This would expand the impact area for each alternative from approximately 0.34 acres to 0.6 acres.

The location of the detention basin was chosen after evaluating all other possible locations on the base along with contributing watershed areas. This detention facility would be located upstream of the project site, adjacent to a drainage channel south of Third Street, and to avoid impacting wetlands the basin would be located outside of these areas (Figure 6-9). Locating the basin upstream of the project site is necessary due to bird-airstrike hazard (BASH) issues on the base. Facilities that create an attraction for waterfowl are not permitted within the BASH zone.

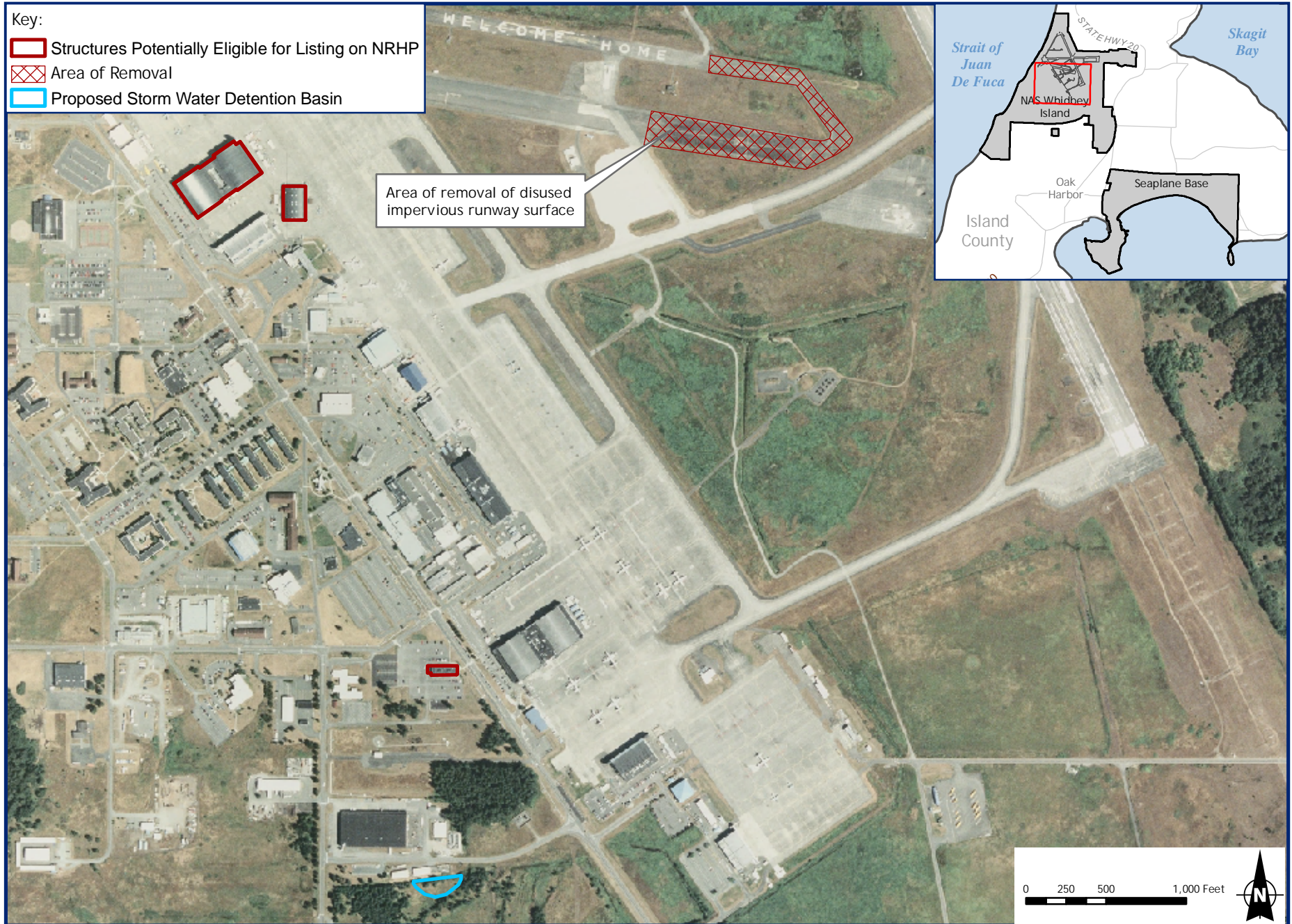


Figure 6-9  
Disused Runway Location Proposed for Removal  
NAS Whidbey Island, Island County, Washington



### **6.10.3 Floodplains**

Areas within the 100-year floodplain at Ault Field have not been mapped by the Federal Emergency Management Agency (FEMA). However, as noted in Section 5.10.3, none of the proposed construction areas at NAS Whidbey Island are prone to flooding from storm water flow through the airfield ditch system. The Navy conducted hydrologic modeling to determine the post-construction condition of the addition of up to 40.7 acres of new impervious surface at Ault Field. (The largest new impervious surface proposed would be 32.6 acres under Alternative 2; however, the Navy would remove 8.14 acres of a disused runway.) Depending on the results of this modeling and analysis, the drainage network at the airfield would be improved as necessary to control storm water flow and manage the flood risk.

Under the No Action Alternative no additional facilities would be constructed to support the current operations of P-3C aircraft; therefore, the 100-year floodplain would not be affected.

### **6.10.4 Groundwater**

The proposed action would not impact the three groundwater aquifers in the vicinity of Ault Field. None of the proposed construction at the station would extend below surface at a depth that would impact the underlying water tables. Although fuel or other chemicals could be spilled during construction, immediate clean-up of these spills would prevent any infiltration into the underlying groundwater. Since the number of personnel employed or stationed at NAS Whidbey Island would not significantly increase or decrease under any of the replacement alternatives, there would be a negligible change in the demand for groundwater from the regional aquifer system.

Under the No Action Alternative no additional facilities would be constructed to support the current operations of P-3C aircraft; therefore, groundwater resources would not be affected.

### **6.10.5 Wetlands**

Of the 531 acres of wetland at Ault Field, approximately 71.92 acres of palustrine emergent wetland habitat is within or immediately adjacent to Construction Areas Nos. 1 and 3; no wetlands are located in Construction Area No. 2 (see Appendix K). The Navy has conducted facility reviews to minimize wetland impacts while meeting operational requirements.

The proposed action would affect emergent wetlands under all alternatives and would occur as a result of constructing the aircraft parking apron and additional hangar space around the existing aircraft parking apron at the south end of the flight line.

The estimated wetland-impact areas for each alternative were developed using the jurisdictional determined wetland boundaries overlaid with the conceptual construction footprint areas identified in Figure 2-8. The total wetland loss at NAS Whidbey Island as a result of each of the proposed construction projects under all alternatives are estimated at 0.23 acres (Alternatives 1 and 5); 2.14 acres (Alternative 6); 2.46 acres (Alternative 3); 6.74 acres (Alternative 4); and 6.76 acres (Alternative 2). These totals assume that wetland-avoidance measures would be incorporated into the final siting design of the proposed facilities.

Under the authority of Executive Order 11990, *Protection of Wetlands*, federal agencies are required to adopt a policy to avoid to the greatest extent possible the long- and short-term adverse impacts associated with the destruction and modification of wetlands and to avoid the direct and indirect support of new construction in wetlands whenever there is a practicable alternative. In addition, mitigation requirements under USACE guidelines stress the policy of wetland avoidance, minimization, and compensation.

Because complete wetland avoidance would not be feasible under Alternatives 1 through 6, a CWA Section 404 permit would be obtained from the USACE and a Section 401 permit from the Washington State Department of Ecology if any of these alternatives are selected. These permits regulate the discharge of dredged and fill materials into waters of the United States, including wetlands. Because Section 401/404 permits remain in effect for a period of five years and construction of the proposed facilities is scheduled to begin more than five years in the future, these permits would be obtained in the appropriate pre-construction timeframe. As part of the permitting process, methods of impact minimization and alternatives would be evaluated. Appropriate mitigation measures also can be used to minimize or neutralize adverse impacts resulting from construction of the proposed parking apron and hangar. For example, short-term impacts could be mitigated by establishing proper erosion-control structures at the edge of the affected area to minimize sedimentation flow into adjacent wetland areas. Appropriate construction mitigation techniques (e.g., erosion and sedimentation control) would be used to minimize

impacts on wetlands. In addition, when open-water zones intersect the primary surface zones of the footprint, grading would help maintain the existing drainages.

Compensation would be required for long-term impacts resulting from lost wetland acreage that cannot be avoided or minimized. The Washington State Department of Ecology, the USACE, and the EPA have developed guidelines and a ratio in terms of acre-for-acre replacement mitigation ratios. These ratios are set out in *Wetland Mitigation in Washington State Part 2: Developing Mitigation Plans* (Washington State Department of Ecology 2006). Mitigation is considered appropriate and acceptable if, based on an approved evaluation technique, the functions and values determined for the proposed mitigation or replacement wetland are greater than those of the affected wetland area.

The Navy has conducted a facility review to minimize wetland impacts and prepared a draft wetland mitigation plan to identify mitigation for the potential unavoidable wetland impacts at Ault Field (see Appendix L; EDAW, Inc. 2008). The plan was designed to compensate for a maximum total wetland loss (6.76 acres) under Alternative 2. A mitigation site at Crescent Harbor was selected to offset wetland impacts based on criteria outlined in Appendix L (Site Selection Checklist) of the *Wetland Mitigation in Washington State Part 2: Developing Mitigation Plans* (Washington State Department of Ecology 2006).

The Navy presented their conceptual mitigation options to the USACE and the Washington State Department of Ecology during a meeting on September 10, 2007. A reduction of wetland impact acres (not to exceed 6.76 acres) was developed in response to a follow-up meeting with the USACE on October 16, 2007. (As previously discussed, wetlands would not be affected under the No Action Alternative.) Based on comments received during both the September and October meetings, identifying areas that would offer the greatest mitigation for the potential wetland impacts, the Navy modified their conceptual plan.

The 633-acre mitigation site is located north of Crescent Harbor on the Whidbey Island Seaplane Base (Figure 6-10). The site can be broadly divided into two main areas, west and east sides. A jurisdictional wetland delineation of the mitigation site identified 489 acres of jurisdictional waters of the United States and 144 acres of upland (EDAW Inc. 2007).

During the early 1900s, tidal inundation from Crescent Bay was restricted by the construction of a dike parallel to Crescent Bay, channelizing the existing Crescent Bay Creek (on the

west side) and draining the associated marsh to improve site conditions for agriculture. The upstream reach of this stream was modified through channelizing and deepening, filling in some locations, and creating ponds through partial damming. Because of this long history of farming on this site, most of the wetlands have been severely altered. Grassland vegetation is dominated by a combination of nonnative wetland and upland pasture vegetation.

A flap-gate connection from the remaining tidal marsh to Crescent Bay has severely muted tidal inundation throughout this marsh. In addition, disturbance likely has also occurred through channel incision as a result of upstream anthropogenic impacts (agricultural) and the construction of other drainage ditches throughout and upstream of the site. These disturbances have significantly altered the natural hydrologic and geomorphic regime of the mitigation area, with Crescent Bay Creek substantially disconnected from its natural floodplain.

The east side has also been extensively farmed since the early 1900s, resulting in removal and conversion of large areas of riparian and wetland vegetation, probably in conjunction with leveling of topographic diversity. In addition, other minor drainages most likely have been channelized, and it appears from site reconnaissance and recent aerial photography that stock ponds were historically created in the eastern portion of the site.

A separate, ongoing, but related grant-funded project is planned for construction during 2008–2009; however, this project will be phased in as funding becomes available. In an effort to reestablish full tidal action to the lower portion of the site, construction of a new tidal channel inlet between the historical tidal portion of the site and Crescent Bay will be constructed. A new bridge was recently constructed over the proposed inlet location in preparation for construction of the new tidal inlet.

One or more of the following sites would be developed through final design based on site hydrologic, geomorphic, and ecologic suitability, acreage needs, and desired habitat community types. The concepts can be summarized as follows:

- **Crescent Creek Realignment and Riparian Corridor Restoration.** The drainage ditch that Crescent Creek currently flows in would be filled along its entire length and a new channel constructed beginning just south of the culvert outlet at Crescent Harbor Road. The new channel alignment would be designed to follow the historic natural creek alignment as closely as possible, resulting in a shallower and more meandering configuration. The realigned stream channel would be higher in elevation than the existing, incised channel through much of the site. The new channel would transition and meet the marsh plain at approximately pre-disturbance elevation. The stream



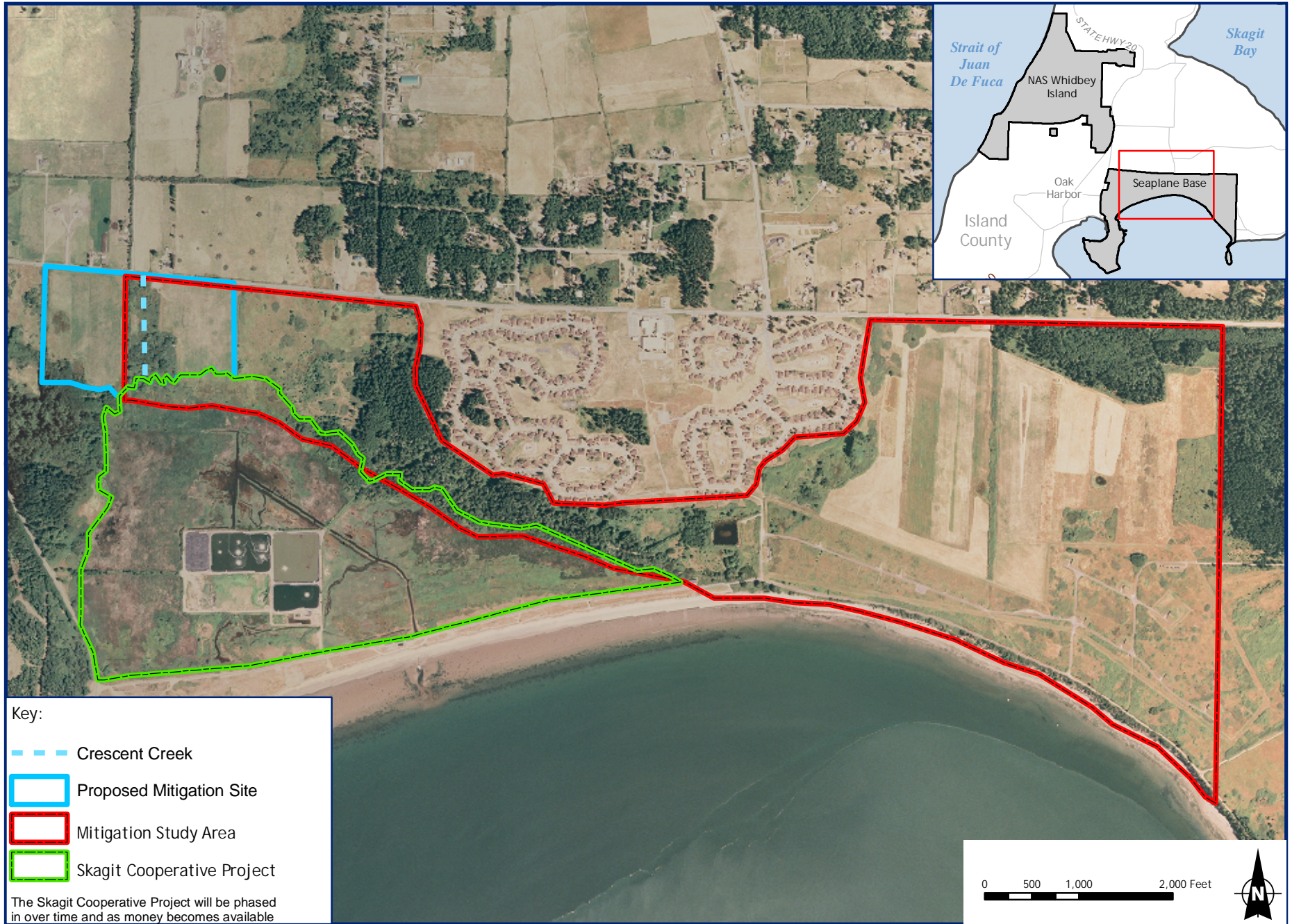


Figure 6-10  
 Proposed Wetland Mitigation Site  
 NAS Whidbey Island, Island County, Washington



channel design would likely include floodplain areas to reconnect the stream to a floodplain and associated wetlands.

- **Rehabilitation of Low Quality, Degraded Wetland Habitats in the Vicinity of Crescent Dam.** The existing hydrologically isolated depression/pond is located west of the proposed new stream channel. Upslope of Crescent Dam would be connected to the new Crescent Bay Creek channel as a potential high-discharge overflow area. The proposed reestablishment of a forested wetland riparian corridor along the new Crescent Bay Creek channel would also encompass the area around the pond. Rehabilitation of this forested wetland area could include removing remnant piles of rock and soil left from excavation of the ponds; recontouring topography to enhance habitat quality; and establishing native wetland species.
- **Restoration of Localized Site Hydrology to Allow for Rehabilitation of Artificially Drained Wetland Habitats in Lower Topographic Positions in Fields.** Several agricultural drainage ditches located in the margins of the mowed fields on both the west and east sides of the proposed new stream channel and riparian corridor would be modified to restore local site hydrology in lower topographic positions of each field. These ditches (approximately 1-foot wide by 1-foot deep) probably were constructed to drain surface and subsurface water on the site in order to use the land for agricultural purposes. “Disconnecting” these ditches would likely reduce the drainage of shallow groundwater and raise groundwater levels. It is proposed that these areas be allowed to recover for one to two years, after which time the hydrology would be evaluated for further rehabilitation activities. Rehabilitation of native wetland plant communities in these areas would involve allowing for natural recovery or developing a planting plan to reestablish site-appropriate native plant communities.
- **Rehabilitation of Degraded Wetland Habitat in Higher Topographic Positions in the Fields.** Scrub-shrub and forested wetland plant communities composed of native plant species would be reestablished in those areas in higher topographic conditions in the unmanaged grass fields where site is drier.

Mitigation ratios would follow those ratios set out in *Wetland Mitigation in Washington State Part 2: Developing Mitigation Plans* (Washington State Department of Ecology 2004). The type of mitigation being proposed would be considered “rehabilitation” because it would restore a degraded wetland. The wetlands that would be impacted as a result of the proposed NAS Whidbey Island P-8A MMA Project would be Category III wetlands (Ecology and Environment February 2008). Based on the mitigation ratios for western Washington, rehabilitation requires a 4:1 mitigation ratio for all Category III wetland impacts. However, these mitigation ratios assume in-kind mitigation, while out-of-kind mitigation may increase requirements. Final mitigation ratios would be determined through discussions with the regulatory agencies (USACE

and Washington State Department of Ecology) during the final design and permitting phase of the proposed project.

## **6.11 Biological Resources**

### **6.11.1 Vegetation**

Construction of new facilities at Ault Field under Alternatives 1 and 5 would have a minor impact on vegetation. The majority of new construction under these alternatives would occur within Construction Area No.1 (Figure 2-7) and result in the permanent loss of approximately 5.6 acres of herbaceous vegetation, most of which is maintained grass. The vegetation permanently removed for the new facilities under these alternatives would total less than 1% of the currently vegetated area at the base. Furthermore, none of the affected vegetation communities are considered unique or regionally significant.

Construction of new facilities under Alternatives 2, 3, 4, and 6 would have a moderate impact on vegetation. The majority of new construction under these alternatives would also occur in Construction Area No.1 and result in the permanent loss of approximately 11.8 acres of herbaceous vegetation under Alternative 3; 21.6 acres of herbaceous vegetation under Alternative 6; 32.5 acres of herbaceous vegetation under Alternative 4, and 32.6 acres of herbaceous vegetation under Alternative 2. These impacts would include the loss of up to approximately 6.7 acres (Alternatives 2 and 4) of emergent wetland and 9 acres of maintained grass. An additional approximately 0.2 acres of maintained grass would be removed under these alternatives in Construction Area No. 3 for the ordnance storage facility (Figure 2-7). The overall impact from the loss of between approximately 11 and 32 acres of herbaceous vegetation from Ault Field under Alternatives 2, 3, 4, and 6 is lessened given that more than 2,000 acres of herbaceous vegetation occurs in the surrounding area of the station. Furthermore, none of the affected vegetation communities are considered unique or regionally significant.

### **6.11.2 Wildlife**

The maintained grasslands and emergent wetlands that would be affected by the proposed construction activities support various wildlife species such as migratory waterfowl, song birds, raptors, mammals, reptiles, and amphibians. These species commonly use these grasslands and

emergent wetland habitats for foraging and occasional nesting. Construction activities in these areas would result in both direct and indirect impacts on resident wildlife. Direct effects could include mortality of less mobile species such as small mammals, reptiles, and amphibians. The loss of between approximately 5.6 acres (Alternatives 1 and 5) and 32.6 acres (Alternatives 2 and 4) of herbaceous vegetation at Ault Field, concentrated primarily in Construction Area No. 1, would cause the migration of species to other areas with suitable habitat, indirectly resulting in a decrease in the number of wildlife species in the area. However, the overall loss of wildlife species is considered minor, given the relatively large amount of suitable habitat that would remain near the proposed developments. Since the proposed construction projects are located directly adjacent to existing developed areas, negligible impacts on wildlife as a result of habitat fragmentation would occur. Temporary displacement of wildlife may occur in peripheral areas during construction, when noise and human activity levels increase. However, once construction has been completed, wildlife should return to these peripheral areas. Some wildlife species such as songbirds, small mammals, reptiles, and amphibians that are able to adapt to the landscaped conditions of urban environments can be expected to inhabit the developed areas.

The following operational changes associated with each of the replacement alternatives at NAS Whidbey Island were considered in evaluating the potential for significantly impacting wildlife:

- The annual number of flight operations as per the P-8A MMA flight syllabus could decrease up to 7% (under Alternative 1) or increase by up to 31% (under Alternative 4);
- No significant change in the type, location, or current ratio of daytime and nighttime operations as per the P-8A MMA flight syllabus;
- A negligible change in the land area within the greater-than-65 dB DNL noise contour;
- While the P-8A MMA is approximately 1 dB louder than the P-3C during takeoff, the P-8A MMA climbs faster on departure than does the P-3C, resulting in a comparable noise impact on the ground; and
- The P-8A MMA is approximately 2 dB louder than the P-3C during landing, causing a slightly higher yet still comparable noise impact on the ground.

These operational changes associated with the proposed action would not significantly impact wildlife. Studies have been conducted that have focused on investigating the impacts of

aircraft noise on wildlife and domestic animal species. These studies have involved observations of a variety of species, including waterfowl, shore birds, song birds, terrestrial mammals, marine mammals, and domestic animals (cows, chickens, sheep, and horses). Overall, the literature suggests that species differ in their response to aircraft noise (Manci et al. 1988). All species (those previously not exposed to aircraft noise), however, seem to initially respond with some form of a startle response, the intensity and duration of which diminishes or disappears with subsequent exposures. Other general responses include running, stampeding, flying, circling, or becoming motionless. Several studies indicate that there is a strong tendency for species to acclimate or habituate to noise disturbances (Grubb and King 1991; Ellis et al. 1991; Manci et al. 1988; Fraser et al. 1985; Fleming et al. 1985; Black et al. 1984). Given the nature of the current NAS Whidbey Island operations, locally occurring wildlife species have likely become habituated to aircraft noise. Additionally, the predicted negligible change in noise levels would have no adverse, or disruptive, impacts on local wildlife populations.

Under the No Action Alternative no additional facilities would be constructed to support the current operations of P-3C aircraft and current aviation activities at the station would continue unchanged; therefore, wildlife would not be affected.

#### **6.11.2.1 Migratory Birds**

As mentioned in Section 5, Existing Environment: NAS Whidbey Island, Section 5.11, routine operation and maintenance of P-8A MMA at the airfield and proposed construction of support infrastructure are not exempt from the take prohibitions of the Migratory Bird Treaty Act (MBTA) (see Rule 72 Federal Register [FR] 56926). As noted above in the discussion of wildlife impacts, the predicted negligible change in noise levels would not cause adverse or disruptive impacts on local wildlife populations, including migratory bird species. While the proposed new construction will disturb between approximately 5.6 and 32.6 acres of habitat potentially used by various species of neotropical migratory songbirds, removal of this habitat would have a negligible impact on migratory bird species populations at the station, based on the availability of remaining suitable habitat (see also Section 6.11.1). Furthermore, no direct mortality of migratory birds would occur from construction because they would relocate to suitable habitat areas during construction activities. The NAS Whidbey Island BASH Plan and INRMP also provide project and operations guidance to aid in MBTA compliance.

#### **6.11.2.2 Bird-Aircraft Strike Hazard**

No aspect of the replacement alternatives or No Action Alternative would create attractants that would have the potential to increase the concentration of birds in the vicinity of the airfield. Therefore, considering the decrease in annual operations and utilization of existing flight tracks, no increase in the bird-aircraft strike hazard (BASH) risk would occur at NAS Whidbey Island.

#### **6.11.3 Threatened and Endangered Species**

##### **6.11.3.1 Aquatic Species**

Eight of the nine federally threatened and endangered species identified as potentially occurring on or in the immediate vicinity of Ault Field are either aquatic species or species closely associated with the marine environment, including the Steller sea lion, humpback whale, southern resident killer whale, marbled murrelet, leatherback sea turtle, Puget Sound chinook salmon, Puget Sound steelhead, and bull trout. This list of Endangered Species Act (ESA)-listed species known to occur or potentially occur in the general project area (western Washington, Island County, and marine waters of the west coast) was obtained from the U.S. Fish and Wildlife Service (USFWS) Western Washington Fish and Wildlife Office, the National Oceanographic and Atmospheric Administration (NOAA) Fisheries (formerly known as the National Marine Fisheries Service [NMFS]), and the State of Washington Department of Fish and Wildlife (WDFW) websites (EDAW, Inc. 2008).

None of the proposed construction activities at Ault Field would directly affect any of the aquatic habitats that could be inhabited by these species. Furthermore, the proper implementation of measures (outlined in Section 5.10.2) to control storm water runoff from construction sites would prevent the degradation of water quality in the marine waters surrounding the station.

The production and reception of certain sounds are critical in various aspects of marine mammal life history; certain sounds (both natural and anthropogenic) have the potential to interfere with these functions (Southall April 27, 2005). In a summary by the National Park Service (September 12, 1994) on the effects of noise on marine mammals, it was determined that gray whales showed no outward physical behavior response to aircraft noise or overflights. Other anthropogenic noises in the marine environment may have more of an effect on marine mammals

than aircraft noise (U.S. Air Force July 20, 2000). The effects of noise on cetaceans appear to be somewhat attenuated by the air/water interface. The cetacean fauna along the coast of California have been subjected to sonic booms from military aircraft for many years without apparent adverse effects (Tetra Tech, Inc. July 1997). Finally, Eller et al. (June 2000) concluded that there are very few and limited cases for which there could be any risk of injury to or harassment of a marine mammal from underwater noise generated by subsonic flight of Air Force aircraft.

Based on these studies, and considering that the number of annual aircraft operations would decrease and noise exposure would change negligibly, replacing the P-3C aircraft at Ault Field with the P-8A MMA would not disturb any critical aspects of marine mammal life history nor interfere with the foraging activity of any of the protected aquatic species in the vicinity of NAS Whidbey Island. Consequently, the Navy has determined that operations of the P-8A MMA would have no effect on any listed aquatic species in the vicinity of NAS Whidbey Island.

The Steller sea lion, humpback whale, southern resident killer whale, marbled murrelet, leatherback sea turtle, Puget Sound chinook salmon, Puget Sound steelhead, and bull trout could potentially forage in proximity to the Whidbey Island shoreline and therefore be affected by changes in water quality related to storm water discharge. However, any impacts are expected to be minor and highly localized based on implementation of on-site BMPs to reduce storm water runoff and dispersion of storm water in the marine environment. As discussed in Section 6.10.2, the Navy evaluated several options to manage storm water from new construction areas and consequently determined that the proposed action would have no effect on the humpback whale, the southern resident killer whale, the Steller sea lion, the leatherback sea turtle, but may affect, but is not likely to adversely affect marbled murrelet, Puget Sound chinook salmon, Puget Sound steelhead, and bull trout or their respective designated critical habitats (EDAW, Inc. 2008). Based on this analysis of the project effects on salmonid rearing and foraging habitat, the project may affect, but is not likely to adversely affect, essential fish habitat (EFH) in the action area.

Furthermore, the potential cumulative effect of the proposed improvements to water quality and foraging habitat in Crescent Bay and Crescent Bay Marsh from wetland mitigation/stream restoration and marsh restoration would be beneficial to both Puget Sound bull trout and Puget Sound chinook salmon (EDAW 2008). The Navy conferred with and asked for concurrence from the USFWS and NOAA Fisheries regarding the storm water management options

and determination of effects in letters dated July 23, 2008. NMFS, in a letter dated August 4, 2008, concurred with the Navy's findings, and the USFWS concurred with the Navy's findings in a letter dated September 5, 2008 (see Appendix E).

#### **6.11.3.2 Golden Indian Paintbrush**

As discussed in Section 5.11.3, no populations or individual occurrences of golden Indian paintbrush have been identified on Ault Field during previous surveys. Furthermore, little, if any, suitable habitat to support the species occurs within the proposed construction areas. Consequently, the Navy has determined that the proposed action would have no effect on the threatened golden Indian paintbrush (EDAW, Inc. 2008).

#### **6.11.3.3 Other Species of Concern**

Other species of concern on or in the immediate vicinity of Ault Field include the bald eagle, long-legged myotis, long-eared myotis, olive-sided flycatcher, peregrine falcon, northern goshawk, western toad, coho salmon, and Taylor's checkerspot. With the exception of the western toad, each of these species would be only transient visitors to the proposed construction areas because the herbaceous vegetation cover within the construction areas does not provide important foraging or nesting habitat for any of these species. Each of these species is mobile and would likely avoid the work areas during construction, so no direct impacts are anticipated.

The western toad could inhabit the emergent wetlands within Construction Area No. 1, and some loss or displacement of individuals could occur during construction activities. However, considering the large area of similar habitat available on the station, negligible impacts on the local western toad population are anticipated.

Coho salmon may occur in the marine environment adjacent to Ault Field. None of the proposed construction activities at Ault Field would directly affect the aquatic habitat that could be inhabited by this species. Furthermore, the proper implementation of measures (outlined in Section 6.10.2) to control storm water runoff from construction sites and new impervious surfaces would prevent the degradation of water quality in the marine waters surrounding the station (EDAW, Inc. 2008). Therefore, the proposed action would have negligible impacts on this species adjacent to NAS Whidbey Island.

Given the historical occurrence of bald eagles in the vicinity of NAS Whidbey Island, there is the potential for bald or golden eagles to be in the general vicinity of the proposed action. However, none of these species are likely to be present within or adjacent to the proposed construction area because of the absence of preferred foraging or nesting habitat at the airfield. A take permit as authorized under the Bald and Golden Eagle Protection Act (16 U.S.C. §§ 668-668d, June 8, 1940, as amended 1959, 1962, 1972, and 1978) is not applicable. The minor increase in aircraft noise levels under each replacement alternative would not adversely affect these species. Consequently, implementation of the proposed action would have no effect on any species of concern at NAS Whidbey Island.

Based on the operational factors of the proposed action at Ault Field presented in Section 5, no indirect effects on any other species of concern related to aircraft operations or training would occur.

#### **6.11.4 Marine Mammals**

Species protected under the Marine Mammal Protection Act (MMPA) known to occur in the marine waters adjacent to Ault Field (i.e., Puget Sound and the Strait of Juan de Fuca) include the humpback whale, southern resident killer whale, California sea lion, harbor seal, and northern sea otter (Carretta et al. 2007; U.S. Fish and Wildlife Service 2008). As discussed in Section 6.11.3.1, increased storm water discharges into the marine waters surrounding Whidbey Island could have no impact on the humpback whale and southern resident killer whale. Based on the analysis presented in Section 6.11.3.1, the same impact assessment applies to the California sea lion, harbor seal, and northern sea otter. Consequently, the Navy has determined that the proposed action would not result in reasonably foreseeable “takes” of a marine mammal species by harassment or injury or mortality as defined under the MMPA.

### **6.12 Cultural Resources**

#### **6.12.1 Architectural Resources**

Effects on historic resources included or that are eligible for listing in the National Register for Historic Places (NRHP) were evaluated with regard to the *Criteria of Effect and Adverse*



*Effect*, established by the Advisory Council for Historic Preservation (ACHP) (36 Code of Federal Regulations [CFR] 800.9). These criteria are listed in Table 6-25.

As discussed in Section 5.12.1, five buildings on Ault Field built before 1960 have been determined to be eligible for listing on the NRHP. None of these NRHP-eligible buildings would be physically altered as a result of the proposed construction activities under any of the replacement alternatives. Furthermore, the new construction would be located at a sufficient distance to the east and south of the NRHP-eligible buildings such that these resources would not produce any adverse viewshed effects.

**Table 6-25 Criteria for Adverse Effects on Historic Properties**

Criteria for Adverse Effects
<p>“An adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property’s location, setting, materials, workmanship, feeling, or association. Consideration shall be given to all qualifying characteristics of a historic property, including those that may have been identified subsequent to the original evaluation of the property’s eligibility for the National Register. Adverse effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance, or be cumulative” (36 CFR 800.5[a][1]).</p>
Examples of Adverse Effects
<p>“Adverse effects on historic properties include, but are not limited to:</p> <ol style="list-style-type: none"> <li>1. Physical destruction of or damage to all or part of the property;</li> <li>2. Alteration of a property, including restoration, rehabilitation, repair, maintenance, stabilization, hazardous material remediation and provision of handicapped access that is not consistent with the Secretary’s Standards for the Treatment of Historic Properties (36 CFR Part 68) and applicable guidelines;</li> <li>3. Removal of the property from its historic location;</li> <li>4. Change of the character of the property’s use or of physical features within the property’s setting that contribute to its historic significance;</li> <li>5. Introduction of visual, atmospheric, or audible elements that diminish the integrity of the property’s significant historic features;</li> <li>6. Neglect of a property which causes its deterioration, except where such neglect and deterioration are recognized qualities of a property of religious and cultural significance to an Indian tribe or Native Hawaiian organization;</li> <li>7. Transfer, lease, or sale of property out of Federal ownership or control without adequate and legally enforceable restrictions or conditions to ensure long-term preservation of the property’s historic significance.” (36 CFR 800.5[a][2])</li> </ol>

With respect to the potential for aircraft noise affecting the structural components of historical buildings, Sutherland (1989) studied the effects of low-altitude, high-speed aircraft on structures. This study showed that there is little probability of structural damage occurring as a result of such operations. In addition, there are no historical data in the *Integrated Cultural Resources Management Plan for Naval Air Station Whidbey Island* that document damage to historic structures caused by noise vibrations from aircraft operations. As indicated by the Sutherland (1989) study and past experience, there would be no vibration-related effects on historic properties at the station as a result of the slight change in noise exposure.

Therefore, in accordance with the Advisory Council's regulations concerning the criteria for adverse effects, the Navy has concluded that the proposed action would have no effect on historic resources.

#### **6.12.2 Archaeological Resources**

As discussed in Section 5.12.2, proposed construction areas at Ault Field are located less than 2,500 feet from archaeologically sensitive areas. The Navy completed an archaeological survey of these construction sites to document the presence/absence of archaeological resources. A historic logging site with a dugout area, several push piles, cut tree stumps, and evidence of an old road were found in Construction Area No. 3. These archaeological sites would not be modified as a result of the proposed action. Remnants of maintenance structures associated with 20th century farming or dairy industry were observed at the proposed mitigation site. These sites would not be modified as a result of the proposed mitigation. There is considerable potential that these sites have intact archaeological deposits. The Navy is conducting further testing and data collection (archival materials and oral interviews) to determine NRHP-eligibility; however, none of the proposed construction areas are expected to impact these sites. The Navy will continue its consultation with the Washington SHPO, initiated in a letter dated May 29, 2008, and, as noted in a letter dated June 5, 2008, will work with SHPO to mitigate any potential effects (see Appendix E).

#### **6.13 Hazardous Materials and Waste Management**

Under all siting alternatives, operation and maintenance of the P-8A MMA would not introduce any additional hazardous materials and/or waste streams that cannot be managed by ex-

isting hazardous materials and waste management functions and facilities at NAS Whidbey Island.

NAS Whidbey Island has handled hazardous materials and hazardous waste associated with operation and maintenance of the P-3C aircraft since the early 1990s. A review of the calendar year (CY) 2006 hazardous waste generation report for NAS Whidbey Island showed that the types of chemicals and waste materials associated with operation and maintenance of the P-8A MMA are not substantially different from the types of chemicals and waste materials NAS Whidbey Island is currently managing under its hazardous materials and hazardous waste management programs. NAS Whidbey Island is currently managing hazardous materials and waste associated with operation and maintenance of the P-3C aircraft, and any facilities or functions needed to handle P-8A MMA equipment and its associated materials and waste streams are already in place.

Modifying interiors of existing facilities, including minor changes to room configuration, electrical power routing, heating, ventilation, and air conditioning (HVAC), mountings for replacement equipment, etc., would have no impact on hazardous materials usage or hazardous waste generation at NAS Whidbey Island. These modifications would be completed with minimal quantities, if any, of potentially hazardous materials (e.g., paint, solvents). Vehicle repair and maintenance activities at NAS Whidbey Island are not projected to change with transitioning from P-3C aircraft to P-8A MMA squadrons. None of the avionic systems, engines, or aircraft components on the P-8A MMA would require using different cleaners, coolants, paints, or other hazardous materials than those used to service the existing aircraft fleet. All wastes would continue to be collected, managed, and stored on-site in accordance with NAS Whidbey Island's Central Hazardous Waste 90-Day Accumulation Facility guidelines.

### **Installation Restoration Program (IRP) Sites**

The proposed action would have no impact on on-going remedial activities at NAS Whidbey Island, and none of the proposed renovation and modification activities under any replacement alternative would result in potentially hazardous exposures of on-site personnel. No proposed projects would require large-scale removal or disturbance of surface soil, subsurface soil, groundwater, or existing groundcover near or within any IRP site. Therefore, contaminated media are not likely to be encountered near IRP site locations.

## **7 Existing Environment: MCBH Kaneohe Bay**

### **Introduction**

MCBH Kaneohe Bay is located on the Mokapu Peninsula on the eastern (windward) shore of Oahu, Hawaii.

The existing environment for each relevant environmental resource is described herein to provide the public and agency decision makers with a meaningful baseline from which to compare potential future environmental, social, and economic effects of the proposed action and alternative actions. The environmental impacts on each resource are discussed in Chapter 8, Environmental Consequences: MCBH Kaneohe Bay, and include a consideration of the direct and indirect effects of the proposed action (see Chapter 2, Proposed Action and Alternatives), including the No Action Alternative. Cumulative effects are described in Chapter 11.

This chapter contains a description of the environment that could be affected by replacing P-3C aircraft with P-8A MMA at MCBH Kaneohe Bay. The Council on Environmental Quality (CEQ) regulations implementing the National Environmental Policy Act (NEPA) of 1969 require that an EIS “succinctly describe the environment of the area to be affected or created by the alternatives under consideration” (40 Code of Federal Regulations [CFR] 1502.15). The descriptions of the existing environmental resources that could be affected by implementation of the proposed action and its alternatives need be no longer than necessary. Consistent with this guidance, Navy policy directs that the EIS should exclude material not directly applicable to the expected impact. Therefore, the discussion of the existing environment focuses on those resource areas where there is a potential for significant impact.

Under the replacement alternatives for MCBH Kaneohe Bay, the existing environment may be affected by the following components of the proposed action:

- Aircraft operations;
- New construction and renovation; and
- Personnel relocation or transition.

Accordingly, the discussion of the existing environment in the vicinity of MCBH Kaneohe Bay focuses on airfield operations, noise, land use, air quality, socioeconomics, topography and soils, biological resources, and environmental management practices. In contrast,

since the number of personnel stationed or employed at MCBH Kaneohe Bay would decrease under all alternatives, the following existing environmental resources are not addressed in detail in this EIS because implementation of the proposed action and its alternatives would have a negligible effect or no effect on them:

- **Infrastructure and Utilities.** The decrease in personnel stationed or employed at MCBH Kaneohe Bay would result in a corresponding decrease in water use, wastewater discharge, power use, and solid waste generation and thus result in no increases in demand and no effect on the capacity of existing infrastructure and utilities.
- **Community Services.** Existing community services, including fire protection, emergency, security, and medical services would not change under any of the basing alternatives for MCBH Kaneohe Bay or the surrounding communities because few personnel and their families would require these services.
- **Transportation.** There would be a corresponding decrease in privately owned vehicles, traffic, and the miles traveled under all of the proposed alternatives. Thus, no additional congestion or traffic or transportation requirements on or around the base are anticipated.

## **7.1 Airfield Operations**

Aircraft activities at MCBH Kaneohe Bay include both fixed- and rotary-wing operations. The installation is home to Marine Aircraft Group 24 (MAG-24), which operates the entire U.S. Marine Corps inventory of active CH-53D “Sea Stallion” helicopters; Helicopter Anti-submarine Squadron Light 37, which operates the SH-60B rotary-wing aircraft; and Fleet Logistic Support Squadron 51 and their C-20G fixed-wing aircraft. Furthermore, the base supports Patrol and Reconnaissance Wing Two with three squadrons of P-3C fixed-wing aircraft, including Patrol Squadron (VP)-4, VP-9, VP-47, and a P-3C Update<sup>1</sup> squadron.

The airfield at MCBH Kaneohe Bay includes a single runway, Runway 04/22. This runway is a Class B runway that is 7,767 feet long and 200 feet wide. Four helipads and helicopter landing zones are located to the west of the runway. Under the National Airspace System, the airspace above MCBH Kaneohe Bay is designated as Class D. Air traffic control services to all aircraft operating within it are provided by MCBH Kaneohe Bay airport control.

Table 7-1 identifies the modeled annual flight operations (i.e., any takeoff or landing) at MCBH Kaneohe Bay Field for the baseline year 2011. The 2011 projected baseline operations at MCBH Kaneohe Bay would total 59,423, with approximately 2.1% of these operations occurring

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<sup>1</sup> The P-3C Update aircraft are not part of the P-8A MMA replacement action.

between 10:00 p.m. and 7:00 a.m. (see Table 7-1). The majority of aircraft operations would involve the P-3C fixed-wing aircraft and the CH-53D and SH-60 rotary-wing aircraft. It is expected that the P-3C would be involved in approximately 44% (26,006) of all aircraft operations at the airfield (see Figure 7-1).

**Table 7-1 Baseline Annual Operations at MCBH Kaneohe Bay**

	Airfield Operations		
	Day (7:00 a.m. to 10:00 p.m.)	Night (10:00 p.m. to 7:00 a.m.)	Total
<b>CH-53D</b>			
Departure	1,360	95	1,455
Visual Arrival	1,312	95	1,407
TACAN Arrival	48	0	48
Touch-and-Go	8,698	298	8,996
GCA Pattern	347	17	364
<b>Total</b>	<b>11,765</b>	<b>505</b>	<b>12,270</b>
<b>SH-60</b>			
Departure	1,013	50	1,063
Visual Arrival	987	50	1,037
TACAN Arrival	26	0	26
Touch-and-Go	7,187	233	7,420
GCA Pattern	237	5	242
<b>Total</b>	<b>9,450</b>	<b>338</b>	<b>9,788</b>
<b>P-3C</b>			
Departure	1,552	47	1,599
Visual Arrival	1,552	47	1,599
TACAN Arrival	0	0	0
Touch-and-Go	18,840	200	19,040
GCA Pattern	3,768	0	3,768
<b>Total</b>	<b>25,712</b>	<b>294</b>	<b>26,006</b>
<b>P-3C Update<sup>1</sup></b>			
Departure	123	10	133
Visual Arrival	123	10	133
TACAN Arrival	0	0	0
Touch-and-Go	1,952	0	1,952
GCA Pattern	390	0	390
<b>Total</b>	<b>2,588</b>	<b>20</b>	<b>2,608</b>

**Table 7-1 Baseline Annual Operations at MCBH Kaneohe Bay (continued)**

	Airfield Operations		
	Day (7:00 a.m. to 10:00 p.m.)	Night (10:00 p.m. to 7:00 a.m.)	Total
<b>C-20G(G4)</b>			
Departure	366	17	383
Visual Arrival	260	13	273
TACAN Arrival	107	3	110
Touch-and-Go	196	0	196
GCA Pattern	146	6	152
<b>Total</b>	<b>1,075</b>	<b>39</b>	<b>1,114</b>
<b>Transient Aircraft</b>			
Departure	1,463	43	1,506
Visual Arrival	1,061	36	1,097
TACAN Arrival	403	6	409
Touch-and-Go	4,336	0	4,336
GCA Pattern	277	12	289
<b>Total</b>	<b>7,540</b>	<b>97</b>	<b>7,637</b>
<b>Summary</b>			
Departure	5,877	262	6,139
Visual Arrival	5,295	251	5,546
TACAN Arrival	584	9	593
Touch-and-Go	41,209	731	41,940
GCA Pattern	5,165	40	5,205
<b>Total</b>	<b>58,130</b>	<b>1,293</b>	<b>59,423</b>

Source: Wyle Laboratories, Inc. July 2008.

Note:

<sup>1</sup> The P-3C Update aircraft are not part of the P-8A MMA replacement action.

Key:

GCA = Ground control approach.

TACAN = Air Navigation.

## 7.2 Noise

Aircraft operations, including flight operations and ground engine-maintenance run-ups, are the primary source of noise at MCBH Kaneohe Bay. Flight operations at MCBH Kaneohe Bay are dominated by the P-3C and the CH-53D (see Table 7-1). However, the acoustical energy at MCBH Kaneohe Bay is dominated by C-5 aircraft (see Figure 7-2).

Other flight operations include both rotary- (SH-60) and fixed-wing (C-20G and various transient) arrivals, departures, and patterns.

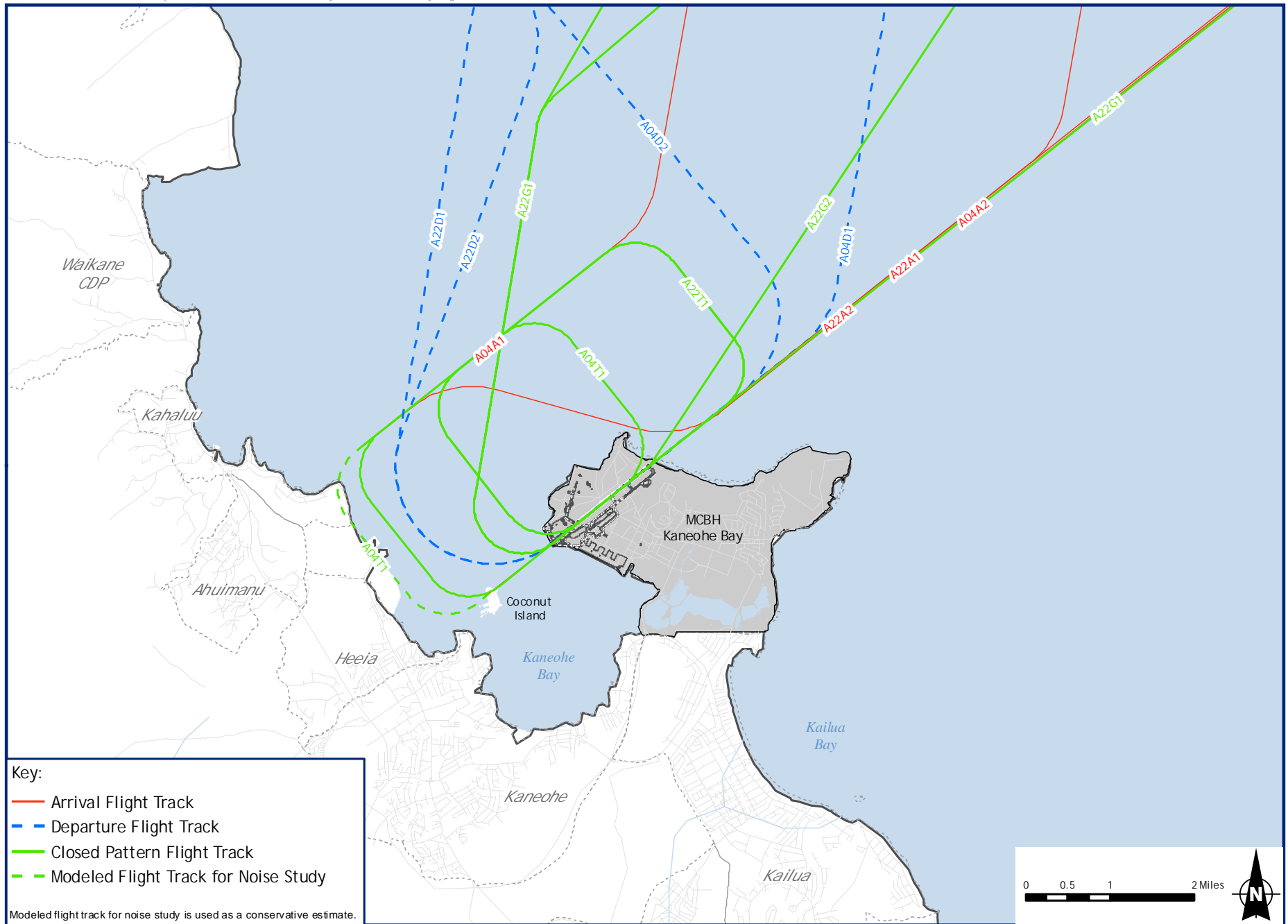
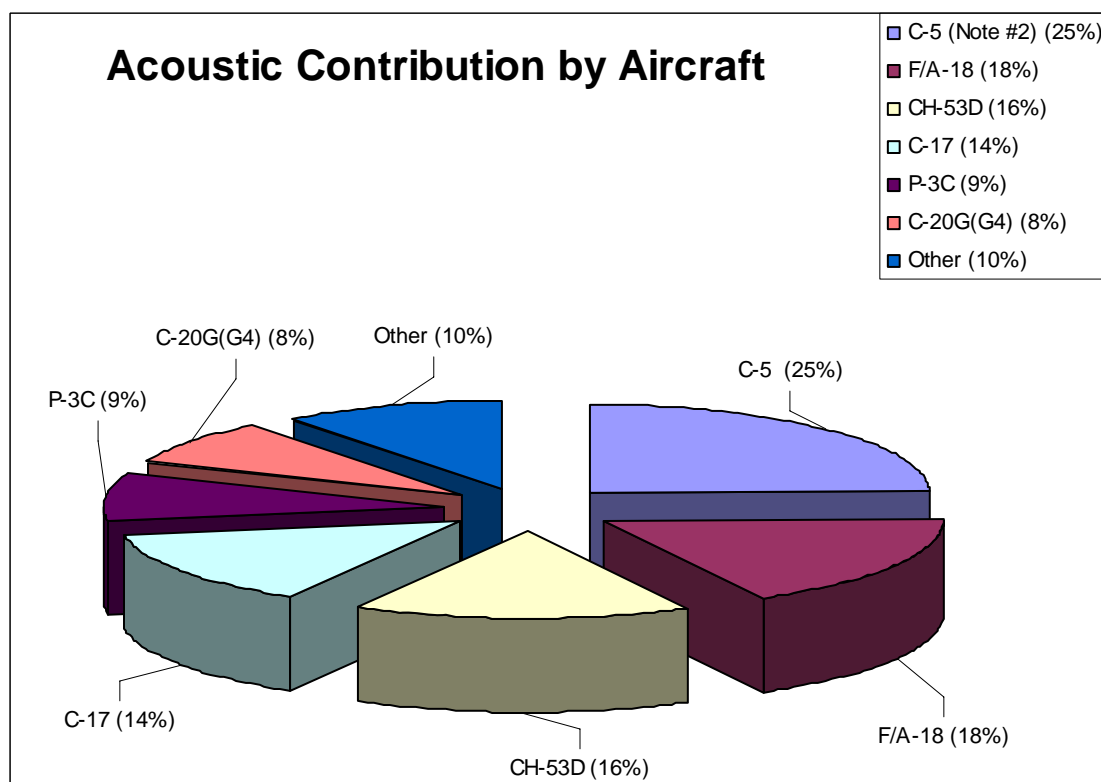


Figure 7-1  
 P-3C Flight Tracks at  
 MCBH Kaneohe Bay, Hawaii





Source: Wyle Laboratories, Inc. 2008

**Figure 7-2 Acoustic Contribution by Aircraft**

In-frame and out-of-frame engine maintenance run-ups are used to test the engine at various power settings and durations. In-frame engine maintenance run-ups designated for low- or high-power testing are conducted at several locations at MCBH Kaneohe Bay and were included in the noise modeling for both baseline and projected noise contours. Out-of-frame engine testing is conducted at an outdoor test stand. Pre-flight engine run-ups generally are not conducted for the types of aircraft stationed at MCBH Kaneohe Bay.

Noise exposure is typically calculated using the day-night average sound level (DNL). The DNL noise metric is based on the number of operations that occur on an average annual day or average busy day over a 24-hour period. The DNL metric includes a 10 decibel (dB) penalty for nighttime operations (10:00 p.m. to 7:00 a.m.) because people are more sensitive to noise during normal sleeping hours, when ambient noise levels are lower. The DNL has been determined to be a reliable measure of community annoyance with aircraft noise and has become the standard metric used by many federal and state governmental agencies and organizations in the

United States, such as the U.S. Environmental Protection Agency (EPA) and the Federal Aviation Administration (FAA), for assessing aircraft noise.

The DNL for the community is depicted as a series of contours that connect points of equal value, usually in 5-dB increments. Calculated noise contours do not represent exact scientific measurements. The area between two specific contours is known as a noise zone. The noise zones used in this study are:

- Less than 65 dB DNL;
- 65 to < 70 dB DNL;
- 70 to < 75 dB DNL; and
- Greater than 75 dB DNL.

Individual response to noise levels varies and is influenced by many factors, including:

- The activity the individual is engaged in at the time of the noise;
- General sensitivity to noise;
- Time of day;
- Length of time an individual is exposed to a noise;
- Predictability of noise; and
- Average temperature.

A small change in dBA (A-weighted decibels) would not generally be noticeable. As the change in dBA increases, individual perception is greater, as shown in Table 7-2.

**Table 7-2 Subjective Responses to Changes in A-Weighted Decibels**

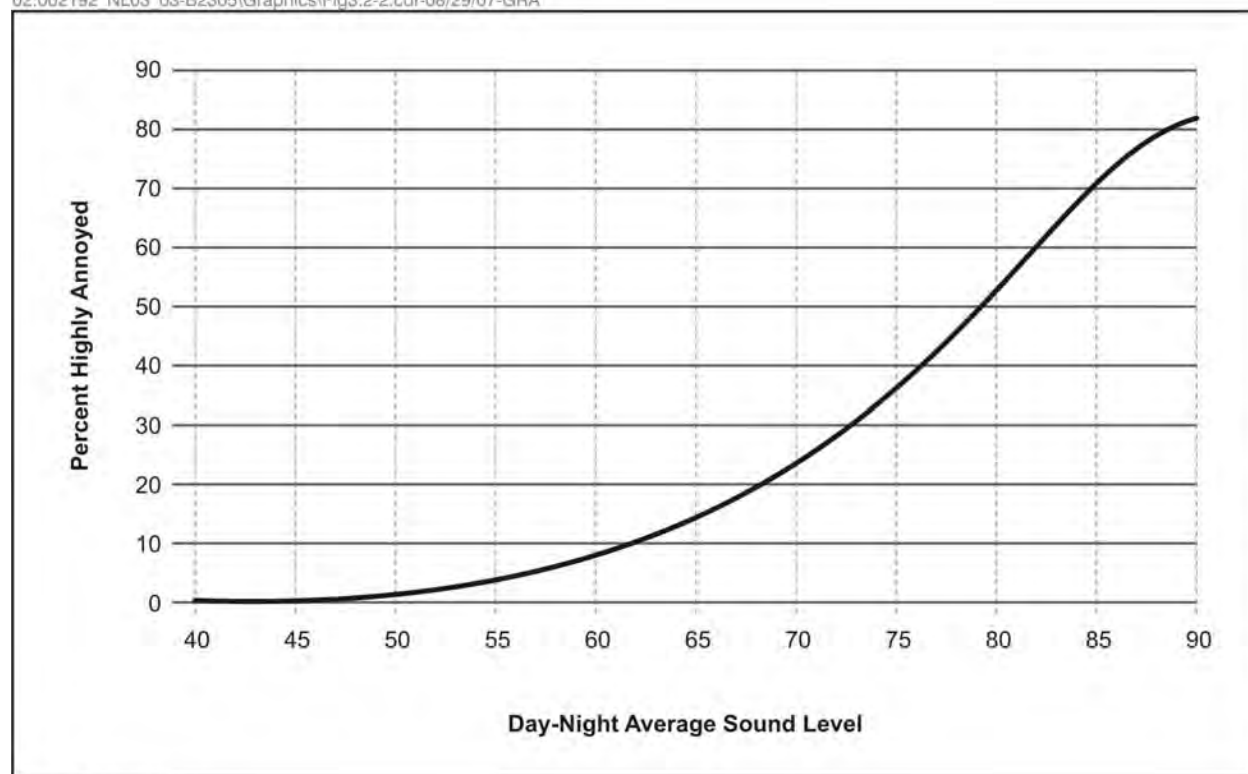
<b>Change</b>	<b>Change in Perceived Loudness</b>
1 dB	Requires close attention to notice
3 dB	Barely perceptible
5 dB	Quite noticeable
10 dB	Dramatic-twice or half as loud
20 dB	Striking – fourfold change

Source: Wyle Laboratories, Inc. October 2004.

However, on a group or community level, various studies and surveys have shown a correlation between DNL and the percentage of people who consider themselves “highly annoyed.” This correlation is shown on Figure 7-3. This curve, which was originally developed in the 1970s and has been updated over the last 10 years, remains the best available method to estimate community response to aircraft noise.

The sound exposure level (SEL) is a composite metric that represents both the intensity of a sound and its duration. Individual time-varying noise events (e.g., aircraft overflights) have two main characteristics: a sound level that changes throughout the event and a period of time during which the event is heard. The SEL provides a measure of the net impact of the entire acoustic event, but it does not directly represent the sound level heard at any given time. During an aircraft flyover, the SEL would include both the maximum noise level and the lower noise levels produced during onset and recess periods of the overflight.

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Source: Schultz 1978

**Figure 7-3 Influence of Sound Level on Annoyance**

The SEL is a logarithmic measure of the total acoustic energy transmitted to the listener during the event. Mathematically, it represents the sound level of a constant sound that would, in one second, generate the same acoustic energy as the actual time-varying noise event. For sound from aircraft overflights, which typically lasts more than one second, the SEL is usually greater than the maximum sound level ( $L_{\max}$ ) because an individual overflight takes seconds and the  $L_{\max}$  occurs instantaneously. The SEL represents the best metric to compare noise levels from

overflights (Wyle Laboratories, Inc. July 2008). A discussion of the compatibility of land uses within the noise zones is included in Section 7.3.4.

The noise contours representing the baseline 2011 environment for MCBH Kaneohe Bay (see Figure 7-4) were developed using estimated average annual airfield operations (see Table 7-1) and average annual engine maintenance run-ups (Wyle Laboratories, Inc. July 2008). The off-station area and the estimated population within the modeled baseline 2011 noise zones are shown in Table 7-3. The noise zones for MCBH Kaneohe Bay primarily extend over the installation and water surrounding the installation. Coconut Island and other small uninhabited islands are the only land areas within the noise zones for MCBH Kaneohe Bay. Since the baseline noise contours are entirely contained over water or over military lands, no civilian populations would be affected by the noise contours. Therefore, no population projection factors have been applied to the baseline conditions at MCBH Kaneohe Bay.

**Table 7-3 Off-Station Area<sup>1</sup> and Estimated Population<sup>2</sup> within Modeled Baseline 2011 Noise Zones for MCBH Kaneohe Bay**

Noise Zone (DNL)	Area (Acres)	Area (Square Miles)	Population
65 to <70 dB	11	0.02	0
70 to <75 dB	5	0.01	0
75 dB or greater	0		0
<b>Total</b>	<b>16</b>	<b>0.03</b>	<b>0</b>

Source: Wyle Laboratories, Inc. July 2008.

Notes:

<sup>1</sup> The area within the 65 dB DNL or greater noise zone does not include the area within the boundary of MCBH Kaneohe Bay or the portion of the noise zone that extends over Kaneohe Bay and the Pacific Ocean.

<sup>2</sup> Census data are reported by blocks. The population shown is a proportion of the census block based on the geographic area of the noise zone. These data should be used for comparative purposes only and are not considered actual numbers within the noise zones.

Key:

dB = Decibel.

DNL = Day-night average sound level.

## **7.3 Land Use**

### **7.3.1 MCBH Kaneohe Bay Land Use**

MCBH Kaneohe Bay occupies approximately 2,951 acres on the Mokapu Peninsula on the east, or windward, shore of Oahu, Hawaii (see Figure 2-4 in Chapter 2, Proposed Action and Alternatives). The base is bordered by the Pacific Ocean on the north, by Kailua Bay on the east, by Kaneohe Bay on the west, and by residential housing on the south. The Marine Corps

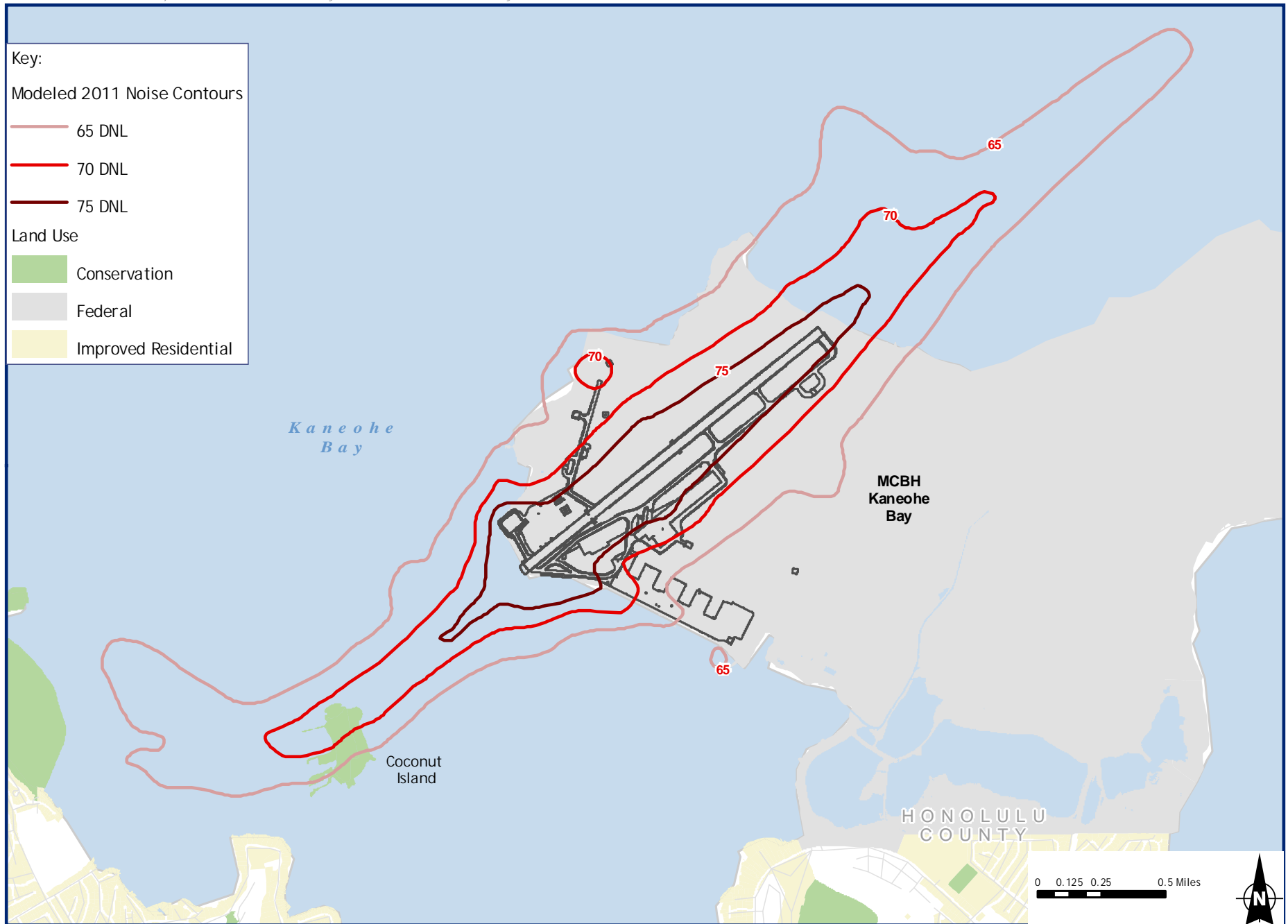


Figure 7-4  
Modeled 2011 DNL Noise Contours for  
MCBH Kaneohe Bay, Oahu, Hawaii

enforces a 500-yard buffer zone in a band extending seaward from the approximately 11 miles of base shoreline into the surrounding marine environment. Approximately 2,220 acres, or 75%, of the base has been developed. Development is constrained on the remainder of the base by various environmental factors, including the presence of wetlands, wildlife management areas (WMAs), cultural resources, and steeply sloping terrain.

The primary land uses at MCBH Kaneohe Bay are the runway and related aircraft operational facilities in the western and southwestern portion of the base and the ground operations and training facilities in the eastern portion of the base. The Marine Corps airfield has one runway 7,771 feet long and 200 feet wide, oriented southwest to northeast. Aircraft operational facilities next to the runway include aircraft parking ramps, taxiways, aircraft maintenance hangars, the air traffic control tower, and various other support facilities. Ground operations and training facilities include several ground maintenance buildings and weapons training ranges. Other developed areas include housing and administrative support and community service facilities, primarily in the center of the base.

The approximately 730 acres of undeveloped land on the base are mostly open space and WMAs. The WMAs include the 517-acre Nuupia Ponds WMA along the southern boundary of the base, which provides a protective buffer zone between operational areas on the base and the civilian community, and the 25-acre Ulupa'u Head WMA along the northeastern shoreline. Both WMAs are managed by MCBH Kaneohe Bay as sensitive ecological and cultural resource areas.

A fence runs along the Nuupia Ponds WMA at the southern border of MCBH Kaneohe Bay. Access to the base is restricted to military and civilian personnel and authorized visitors.

### **7.3.2 Regional Land Use**

MCBH Kaneohe Bay is located within the Koolaupoko planning region of the city and county of Honolulu. The Koolaupoko region covers the windward coastal and valley areas of Oahu from Makapuu Point at the region's eastern boundary to Kaoio Point at the northernmost end of Kaneohe Bay. The city of Honolulu is approximately 18 miles southwest of the base. The two nearest communities are Kaneohe and Kailua, located approximately 2 miles to the southwest and 5 miles to the southeast respectively. Both communities primarily comprise residential land uses.

Predominant land uses in the immediate vicinity of MCBH Kaneohe Bay include:

- Low-density, single-family residential development along the southern boundary of the base and continuing to the southwest and southeast in the towns of Kaneohe and Kailua.
- Commercial developments located mainly along Kamehameha Highway from Like-like Highway north to Haiku Road in Kaneohe and around the intersection of Oneawa Street and Kailua Road in Kailua.
- Institutional uses, including several elementary schools, the Samuel Wilder King intermediate school, and James B. Castle high school. Additionally, Hawaii State Hospital and Hawaii Pacific University (secondary campus) are located in Kaneohe. Moku O Loe (or Coconut Island), the only inhabited island in Kaneohe Bay, is home to the University of Hawaii Institute of Marine Biology.
- Light industries in Kaneohe, located on Kamehameha Highway, Heeia Road, and the H-3 freeway.
- Large areas of open space, preserved land, and agricultural areas, located between Kailua and Kaneohe, to the west of Kaneohe, and on the slopes of the Koolau Mountain Range.

### **7.3.3 Land Use Controls**

Development within and around MCBH Kaneohe Bay is controlled, guided, or influenced by the following plans, programs, and policies:

- The Navy and Marine Corps Air Installations Compatible Use Zones (AICUZ) Program;
- The 2006 Marine Corps Base Hawaii Master Plan;
- The 2006 Marine Corps Base Hawaii Integrated Natural Resources Management Plan (INRMP);
- The 2006 Marine Corps Base Hawaii Integrated Cultural Resources Management Plan (ICRMP);
- The 1999 Koolaupoko Sustainable Communities Plan; and
- The Hawaii Coastal Zone Management (CZM) Program.

### **AICUZ Program**

The AICUZ Program was established in the 1970s by the Department of Defense (DoD) to analyze operational training requirements and to address communities' concerns about aircraft noise and accident potential. The purpose of the AICUZ Program is to achieve compatibility between air installations and neighboring communities by:

- Protecting the health, safety, and welfare of civilians and military personnel by encouraging land use that is compatible with aircraft operations;
- Protecting Navy and Marine Corps installation investment by safeguarding the installation's operational capabilities;
- Reducing noise impacts caused by aircraft operations while meeting operational, training, and flight safety requirements; and
- Informing the public about the AICUZ Program and seeking cooperative efforts to minimize noise and potential aircraft accident impacts.

An AICUZ study analyzes aircraft noise, accident potential, land-use compatibility, and operational procedures and provides recommendations for compatible development near air installations. Federal, state, regional, and local governments are encouraged to adopt guidelines promoting compatible development. The AICUZ Program defines the noise zones and the accident potential zones (APZs) that represent the minimum acceptable area where land-use controls are needed to protect the health, safety, and welfare of those living near the installation and to preserve the military flying mission.

**Noise.** Under the AICUZ Program, noise zones are identified as the area between the calculated noise contours, based on the number of operations that occur on an average annual day or average busy day (see Section 7.2 above). For land-use planning purposes, the noise zones are grouped into three noise zones. Noise Zone 1 (less than 65 dB DNL) is generally considered an area of low or no noise impact. Noise Zone 2 (65 to 75 dB DNL) is an area of increased impact where some land-use controls are required. Noise Zone 3 (greater than 75 dB DNL) is the most affected area and requires the greatest degree of land-use control.

**APZs.** The number and type of airfield operations are also used as the basis for identifying APZs around an airfield. While the likelihood of an aircraft mishap occurring is remote, the Navy identifies areas of accident potential to assist in land-use planning. APZs are areas where an aircraft mishap is most likely to occur and are delineated based on historical data and departure, arrival, and pattern flight tracks on and near the airfield runways. The Navy recommends to local planning agencies that developments that concentrate large numbers of people, such as apartments, churches, and schools, be constructed outside the APZs.

APZs include three restricted areas, with the areas nearest the runways having the most restrictions. These areas, the Clear Zone, APZ 1, and APZ 2, are configured as follows:



- **Clear Zone.** The Clear Zone extends 3,000 feet beyond the end of the runway; it measures 1,500 feet wide at the end of the runway and 2,284 feet wide at its outer edge.
- **APZ 1.** APZ 1 extends 5,000 feet beyond the Clear Zone, with a width of 3,000 feet at its outer edge. APZ 1 is typically rectangular, although it may curve to conform to the predominant flight track.
- **APZ 2.** APZ 2 extends 7,000 feet beyond APZ 1, with a width of 3,000 feet. This zone is typically rectangular, although it too may conform to the curve of the predominant flight track.

Although ultimate control over land use and development in the vicinity of military facilities is the responsibility of local governments, the Navy recommends, through its AICUZ Program, that localities adopt programs, policies, and regulations to promote compatible development where appropriate and feasible near Naval and Marine Corps air installations. Such land-use recommendations by the Navy are intended to serve as guidelines; they are based on the assumption that noise-sensitive uses (e.g., houses, churches, hospitals, amphitheaters, etc.) should be located outside the high-noise zones and that people-intensive uses should not be located in APZs. The purpose of the Navy's land-use recommendations is not to preclude productive use of land around Naval and Marine Corps air installations but to recommend best uses of the land that are protective of human health, safety, and welfare. The Navy's recommendations can be implemented by ensuring development restrictions are placed on noise-sensitive uses in high-noise zones and on people-intensive uses in APZs as well as fair disclosure in real estate transactions and the use of sound-attenuating construction.

The AICUZ Program for MCBH Kaneohe Bay was first established by the Navy in 1976. MCBH Kaneohe Bay's AICUZ was last updated in 2003 to account for changes in airfield operations. The changes included the relocation of assigned F/A-18, CH-46E, and C-12 squadrons to other locations; the addition of C-20G and CH-53D aircraft operations; relocation of NAS Barbers Point SH-60B and P-3C squadrons to MCBH Kaneohe Bay; an increased operational tempo; and expanded hours of airfield operation.

The MCBH Kaneohe Bay APZs used here are based on the APZs presented in the 2003 AICUZ update. These APZs are representative of conditions at the base projected to occur before the homebasing of the P8A-MMA. The APZs are shown on Figure 7-5. As shown, all of the clear zones and APZs are located on-station or offshore in the Pacific Ocean or Kaneohe Bay.

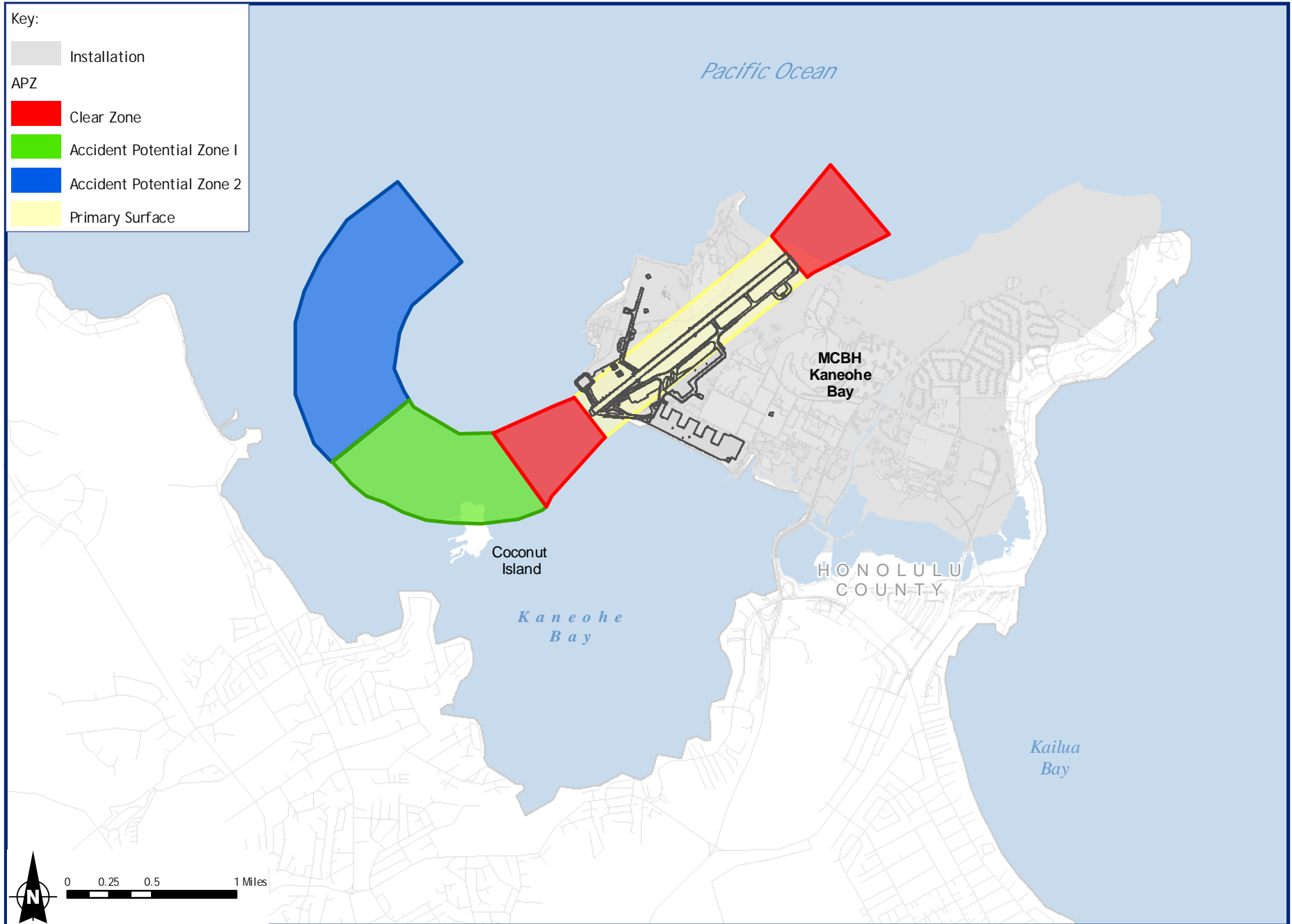


Figure 7-5  
APZs MCBH Kaneohe Bay

### **Marine Corps Base Hawaii Master Plan**

The 2006 Marine Corps Base Hawaii Master Plan was developed to ensure that sufficient land is available for siting new facilities needed to accomplish the mission of MCBH and to reduce incompatible land uses. The plan divides MCBH Kaneohe Bay into six zones according to the primary activity that takes place in that zone. The proposed construction area at the base is located in the Air and Ground Operations and Training Zone.

A future land-use plan for MCBH Kaneohe Bay was prepared as part of the 2006 Master Plan. The land-use plan generally retains the overall pattern of existing development on the base and recommends preserving the remaining open space for future use as dedicated training areas.

The plan also recommends that existing uses should be retained at their current location by demolishing and replacing facilities on or near their current site.

### **Integrated Natural Resources Management Plan (INRMP)**

The Marine Corps prepared an Integrated Natural Resources Management Plan/Environmental Assessment (INRMP/EA) for MCBH Kaneohe Bay in 2001, which was subsequently reviewed and updated in 2006. The updated INRMP fulfills the requirements of DoD Instruction 4715.3 and the Sikes Act (16 United States Code [U.S.C.] 670a et seq.), as well as other pertinent laws (e.g., the Endangered Species Act [ESA]). The overall goal of the MCBH Kaneohe Bay INRMP is to identify and implement strategies to help maintain quality training lands and quality of life for the military population while also ensuring that land use and natural resources management are integrated and consistent with federal and state stewardship requirements.

The MCBH Environmental Compliance and Protection Department is responsible for the programmatic oversight, management, and supervision of natural resource management at the base.

### **Integrated Cultural Resources Management Plan (ICRMP)**

MCBH must manage its cultural resources in compliance with the requirements of the National Historic Preservation Act (NHPA). The purpose of MCBH's ICRMP is to advance the protection, enhancement, and contemporary use of the cultural and historic properties owned by the Marine Corps. The ICRMP applies to seven MCBH properties, including Kaneohe Bay. The

plan identifies management actions that should be completed in compliance with Section 106 and Section 110 of the NHPA.

### **Koolaupoko Sustainable Communities Plan**

The Koolaupoko Sustainable Communities Plan is one of eight community-oriented plans on the island of Oahu intended to help guide public policy, investment, and decision-making through the 2019 planning horizon. The plan assumes a long-term commitment to a military presence in Koolaupoko and sets forth principles of environmental compatibility and public shoreline access and guidelines for military facilities. The plan also reaffirms the region's role in Oahu's development pattern by establishing the following principles for future land use and development in Koolaupoko:

- Limit the potential for new housing in the region so that significant residential growth is directed instead to primary urban centers located closer to Honolulu.
- Revitalize existing commercial centers and limit the expansion of commercial centers and economic activity in the region to promote the development and growth of employment in the primary urban centers located closer to Honolulu.
- Maintain the predominantly low-rise, low-density, single-family form of residential development in the region.
- Maintain the northern and southern portions of the region as predominantly agricultural and preservation land uses.
- Maintain the towns of Kaneohe and Kailua as urban fringe areas with limited future population growth.

### **Hawaii Coastal Zone Management (CZM) Program**

MCBH Kaneohe Bay is located within the state of Hawaii's coastal zone. The Coastal Zone Management Act (CZMA) of 1972 encourages states to develop management plans for coastal zones to protect natural resources and shoreline-related commercial land uses of the nation's shorelines. Section 307 of the CZMA stipulates that where a federal project initiates reasonably foreseeable effects on any state's coastal use or resource (land or water use or natural resources), the action must be consistent to the "maximum extent practicable with the enforcement policies of approved State management programs" (16 U.S.C. 1456 (c)(1)(A)).

Hawaii's CZM program was approved by the federal government in 1977. Hawaii's CZM program document was most recently updated in 1990 and is implemented by the State Office of Planning. Under the program, activities that impact any land use, water use, or natural

resource of the coastal zone must comply with the following ten enforceable policies: Recreational Resources, Historic Resources, Scenic and Open Space Resources, Coastal Ecosystems, Economic Uses, Coastal Hazards, Managing Development, Public Participation, Beach Protection, and Marine Resources.

Federal lands such as MCBH, which are “lands the use of which is by law subject solely to the discretion of the Federal Government, its officers, or agency,” are statutorily excluded from the CZMA’s definition of Hawaii’s “coastal zone” (16 U.S.C. Section 1453 (1)). If, however, the proposed federal activity affects coastal uses or resources or uses beyond the boundaries of the federal property (i.e., has spillover effects), the CZMA Section 307 federal consistency requirement applies.

#### **7.3.4 Land-Use Compatibility Assessment**

To determine the compatibility of land use with existing aircraft operations at MCBH Kaneohe Bay, the 2011 baseline noise contour map was overlaid on the Honolulu County land use map. As previously discussed, the 2011 baseline noise contours are representative of conditions at MCBH Kaneohe Bay prior to the introduction of the P-8A MMA. Land-use designations within the 2011 baseline noise zones were compared with the Navy/Marine Corps land-use compatibility recommendations under its AICUZ program (see Appendix G).

Table 7-4 provides the total area, by land-use category, within the 65 to 70 dB DNL, 70 to 75 dB DNL, and the greater-than-75 dB DNL noise zones around MCBH Kaneohe Bay. All land-use categories in the less-than-65-dB DNL noise zone are considered to be compatible, according to the AICUZ guidelines.

**Table 7-4 Existing Land Uses within Noise Zones at MCBH Kaneohe Bay**

Land Use	Noise Zone (acres)			Total Acres (% of Total Land Use)
	65 to 70dB DNL	70 to 75dB DNL	>75 dB DNL	
Military	287	192	260	739 (41)
Water	797	248	64	1,109 (58)
Conservation	11	10	0	21 (1)
<b>Total</b>	<b>1,095</b>	<b>450</b>	<b>324</b>	<b>1,869 (100)</b>

As shown in Table 7-4 and on Figure 7-6, military land and water encompass approximately 1,848 acres, or 99%, of the area within the MCBH Kaneohe Bay noise zones.

Both military land and water uses are considered compatible with aircraft operations. The 21 acres designated as conservation land use comprise Coconut Island. This island, located within Kaneohe Bay, has been a marine reserve for more than 30 years and is used by the Hawaiian Institute of Marine Biology to study reef fishes that are important in commercial and recreational fisheries (Wetherbee et al. 2004). No residential land is located within the greater-than-65-dB DNL noise contours at MCBH Kaneohe Bay.

## **7.4 Air Quality**

### **7.4.1 Air Quality Regulations**

The Clean Air Act (CAA) is the primary federal statute governing the control of air quality. The CAA designates six pollutants as “criteria pollutants” for which National Ambient Air Quality Standards (NAAQS) have been established to protect public health and welfare. These include particulate matter less than 10 microns in diameter (PM<sub>10</sub>), carbon monoxide (CO), sulfur dioxide (SO<sub>2</sub>), nitrogen dioxide (NO<sub>2</sub>), lead (Pb), and ozone (O<sub>3</sub>). Areas that do not meet NAAQS for criteria pollutants are designated “nonattainment areas” for that pollutant. Areas that achieve the air quality standard after being designated nonattainment are redesignated as attainment following EPA approval of a maintenance plan. Under the CAA, state and local agencies may establish ambient air quality standards (AAQS) and regulations of their own, provided these are at least as stringent as the federal requirements. Table 7-5 summarizes the federal and state AAQS.

The location of the proposed action is under the jurisdiction of the Hawaii Department of Health. The state of Hawaii is designated as in attainment for all criteria pollutant standards.

Because the region is in attainment, the CAA General Conformity Rule does not apply, and a General Conformity Determination is not required.

### **7.4.2 Existing Emissions**

Sources of air pollutants at MCBH Kaneohe Bay include mobile emissions from aircraft, ground service equipment and vehicles, private and government vehicles, and emissions from stationary sources. The activities that would be affected by this action are limited to the replacement of the three P-3C squadrons based at MCBH Kaneohe Bay. Emissions of criteria pollutants result from aircraft flight operations and maintenance (run-ups and test cell) of the air-

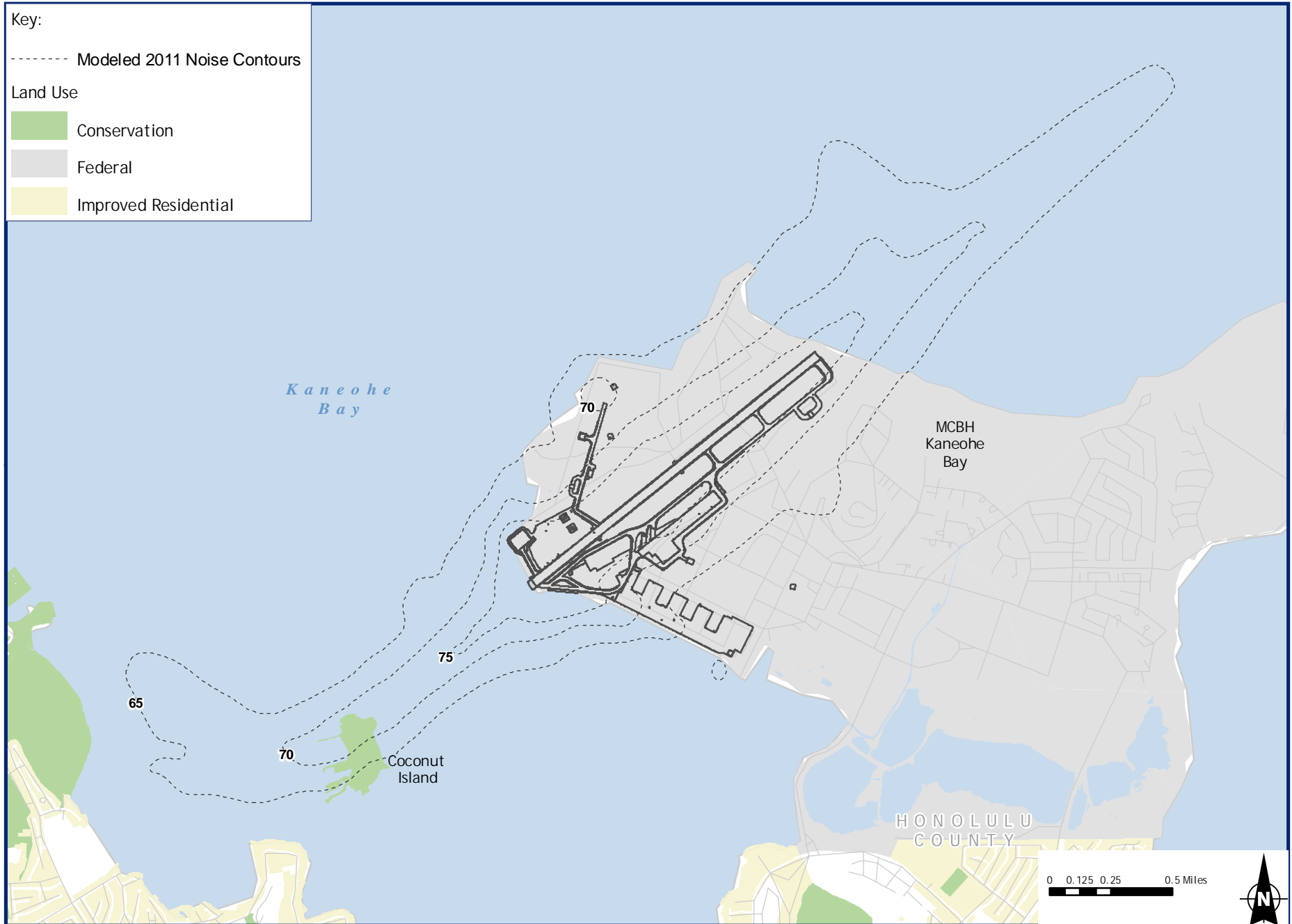


Figure 7-6  
Existing Land Uses within Modeled 2011 DNL  
Noise Contours in the Vicinity of MCBH Kaneohe Bay  
Oahu, Hawaii

craft. Aircraft emissions were calculated using emission factors provided by the Navy's Aircraft Environmental Support Office (AESO) (April 2000) and operations information from station personnel (Wyle Laboratories, Inc. October 2004). Emissions also result from the operation of personally owned vehicles (POVs) that are used by station personnel to commute to work. Emissions from the vehicles of P-3C personnel have been calculated. Annual emissions from the operations of P-3C aircraft and the POVs of personnel affected by this action are summarized in Table 7-6. See Appendix H for emission calculation information.

**Table 7-5 National and Hawaii State Ambient Air Quality Standards**

Pollutant	Averaging Time	NAAQS <sup>1</sup>		Hawaii AAQS <sup>2</sup> Concentration <sup>5</sup>
		Primary <sup>3</sup>	Secondary <sup>4</sup>	
Ozone (O <sub>3</sub> )	1-Hour	–	–	–
	8-Hour	0.08 ppm		Same as NAAQS
Carbon Monoxide (CO)	8-Hour	9.0 ppm (10 µg/m <sup>3</sup> )	None	4.4 ppm
	1-Hour	35 ppm (40 µg/m <sup>3</sup> )		9 ppm
Nitrogen Dioxide (NO <sub>2</sub> )	Annual Average	0.053 ppm (100 µg/m <sup>3</sup> )	Same as Primary Standard	0.04 ppm
		–		
Sulfur Dioxide (SO <sub>2</sub> )	Annual Average	0.03 ppm (80 µg/m <sup>3</sup> )	–	Same as NAAQS
	24-Hour	0.14 ppm (365 µg/m <sup>3</sup> )	–	Same as NAAQS
	3-Hour	–	0.5 ppm (1300 µg/m <sup>3</sup> )	Same as NAAQS
Suspended Particulate Matter (PM <sub>10</sub> )	24-Hour	150 µg/m <sup>3</sup>	Same as Primary Standard	Same as NAAQS
	Annual Arithmetic Mean	50 µg/m <sup>3</sup>		Same as NAAQS
Fine Particulate Matter (PM <sub>2.5</sub> ) <sup>6</sup>	24-Hour	65 µg/m <sup>3</sup>	Same as Primary Standard	–
	Annual Arithmetic Mean	15 µg/m <sup>3</sup>		–
Lead (Pb)	30-Day Average	–	–	1.5 µg/m <sup>3</sup>
	Calendar Quarter	1.5 µg/m <sup>3</sup>	Same as Primary Standard	–

Source: Hawaiian Administrative Rules Chapter 59 (Enterprise Honolulu 2007); U.S. Environmental Protection Agency 2007.

Notes:

<sup>1</sup> NAAQS (other than O<sub>3</sub>, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The O<sub>3</sub> standard is attained when the fourth highest 8-hour concentration in a year, averaged over three years, is equal to or less than the standard. For PM<sub>10</sub>, the 24-hour standard is attained when 99% of the daily concentrations, averaged over three years, are equal to or less than the standard. For PM<sub>2.5</sub>, the 24-hour standard is attained when 98% of the daily concentrations, averaged over three years, are equal to or less than the standard. Contact the EPA for further clarification and current federal policies.

<sup>2</sup> Hawaii Administrative Rules (HAR) Chapter 59.

<sup>3</sup> National Primary Standards: The levels of air quality necessary, with an adequate margin of safety, to protect the public health.

<sup>4</sup> National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

<sup>5</sup> Concentration expressed first in units in which it was promulgated. Parts per million (ppm) in this table refers to ppm by volume or micromoles of pollutant per mole of gas.



**Table 7-6 Emissions Criteria Pollutants from P-3C Aircraft, MCBH Kaneohe Bay, Hawaii (Projected Baseline Year: 2011)**

Operation	Baseline Emissions (tpy)				
	CO	NO <sub>x</sub>	HC	SO <sub>2</sub>	PM <sub>10</sub>
Flight Operations	34.7	52.1	20.7	2.6	23.6
Maintenance	15.3	5.6	10.4	0.4	3.3
<b>P-3C Total</b>	<b>50.0</b>	<b>57.7</b>	<b>31.1</b>	<b>3.0</b>	<b>26.9</b>
POV	36.4	3.6	3.8	0.1	0.5
<b>Total</b>	<b>86.4</b>	<b>61.3</b>	<b>34.9</b>	<b>3.0</b>	<b>27.3</b>

Key:

CO = Carbon monoxide.

HC = Hydrocarbons.

NO<sub>x</sub> = Nitrogen oxide.PM<sub>10</sub> = Particulate matter less than 10 microns in diameter.SO<sub>2</sub> = Sulfur dioxide.

tpy = Tons per year.

## **7.5 Socioeconomics**

Currently available data on population, housing, employment, taxes and revenue, and education were used to project the socioeconomic conditions in the baseline year, 2011. The discussion below indicates the assumptions made and describes how the final estimated numbers have been reached.

### **7.5.1 Population and Housing**

#### **7.5.1.1 Population**

##### **MCBH Kaneohe Bay**

MCBH Kaneohe Bay is home to U.S. Marine Corps (USMC) and Navy personnel and a variety of other tenants. According to the 2006 MCBH Kaneohe Bay Master Plan, the projected base-loading numbers for fiscal year (FY) 2010 (the available data closest to the baseline year) are 11,177 military, civilian, and contractor personnel (see Table 7-7).

These numbers do not include transient personnel. There are an additional 2,198 personnel at Camp Smith and approximately 1,004 retirees local to MCBH Kaneohe Bay (U.S. Department of the Navy December 15, 2006).

**Table 7-7 Personnel Loading Summary for  
MCBH Kaneohe Bay, Hawaii**

	2010
<b>Marine Corps</b>	
Officers	707
Enlisted	5,365
<b>Navy</b>	
Officers	460
Enlisted	2,305
Civilians and Contractors	2,340
<b>Total</b>	<b>11,177</b>

Source: U.S. Department of the Navy December 15, 2006.

### **City of Honolulu and Region**

The areas immediately around MCBH Kaneohe Bay include the towns of Kaneohe and Kailua, which are primarily residential areas. Many of the individuals living in these areas are either associated with the military base or commute daily to work in Honolulu.

The island of Oahu comprises the city and county of Honolulu. The county and the city of Honolulu have both experienced periods of growth since 1990 (Table 7-8). However, the populations of the towns of Kaneohe and Kailua have remained essentially stable from 1990 to 2000.

**Table 7-8 Population of MCBH Kaneohe Bay Region (1990-2010)**

	1990	2000	2005	2010	% Change from 1990 to 2010
Honolulu County	836,231	876,156	904,645	952,650	+14%
Honolulu (City)	365,272	371,619	377,379	NA	-
Kaneohe	35,448	34,976	NA	NA	-
Kailua	36,818	36,585	NA	NA	-

Sources: U.S. Census Bureau 2000; U.S. Census Bureau 2005; State of Hawaii, Department of Business, Economic Development, and Tourism August 2004.

#### **7.5.1.2 Housing**

##### **MCBH Kaneohe Bay**

Military housing at MCBH Kaneohe Bay consists of bachelor housing and military family housing. Bachelor officers quarters housing is located in the north-central portion of MCBH Kaneohe Bay next to the senior officer family housing. Staff non-commissioned officers (SNCO) quarters are also in the north-central portion of the base, east of the runway. The SNCO facility is subject to high noise levels because it is close to the runway. Bachelor enlisted quar-

ters (BEQ) facilities are generally within the south-central and eastern portions of MCBH Kaneohe Bay near work areas (U.S. Department of the Navy December 15, 2006).

Family housing areas are generally located outside of high noise zones in the north-central and eastern portions of the base. Base housing is in the process of being privatized. Approximately one-half of the housing units at MCBH Kaneohe Bay were privatized on October 2006, including the units at the Manana housing area. Privatization of the remaining housing is planned for October 2007 (U.S. Department of the Navy December 15, 2006).

### **City of Honolulu and Region**

The number of housing units in Honolulu County and other municipalities local to MCBH Kaneohe Bay increased between 1990 and 2000. In 1990, there were an estimated 281,683 housing units in the county. By 2000, the estimated number of housing units had increased by 12%, to 315,988 (see Table 7-9). This is in keeping with the approximate level of growth that the county is experiencing.

**Table 7-9 Regional Housing Availability (2000)**

	Housing Units				Vacancy Rate (%)
	Owner-Occupied	Renter-Occupied	Vacant	Total	
Honolulu County	156,233	130,217	29,538	315,988	9%
City of Honolulu	65,860	74,468	18,331	158,659	12%
Kaneohe	7,479	3,499	497	11,475	4%
Kailua	8,527	3,686	557	12,770	4%

Source: U.S. Census Bureau 2000.

Some municipalities in the study area have a very high renter-occupancy rate, such as the city of Honolulu, where more than half of the occupied units are rented. The areas immediately surrounding the base (Kaneohe and Kailua) have a higher owner-occupied rate and relatively lower overall vacancy than the rest of the island. Table 7-9 provides further detail about the regional housing market surrounding MCBH Kaneohe Bay.

The vacancy rates for these geographic areas range from 4% to 12%. Housing units in the city of Honolulu have a higher vacancy (32%); however, many properties are used for recreational purposes and may even be second homes or vacation properties (U.S. Census Bureau 2000).

## **7.5.2 Economy**

### **7.5.2.1 MCBH Kaneohe Bay**

Given that MCBH Kaneohe Bay employs more than 11,000 military personnel, contractors, and civilians, it can be considered a major employer on the island of Oahu. The base also contributes significantly to the local economy through the purchase of certain utilities and services and other expenditures.

### **7.5.2.2 Kaneohe Bay Region**

The Kaneohe Bay region is physically separated from the Honolulu metropolitan area but is close enough that many individuals commute to and from Honolulu for work in Kaneohe Bay. As such, there is a slightly smaller economic base to Kaneohe and Kailua compared with Honolulu; however, the amenities of the larger metropolitan area have an impact on the smaller surrounding communities. Some components of the Kaneohe and Kailua economies include the military base and retirees, but the base is also linked with the economy of Honolulu and the rest of the island of Oahu.

Tourism is the primary business in Hawaii and Honolulu. Millions of non-Hawaii residents come and go from Oahu every year. In 2006, an estimated 7.4 million people visited Hawaii, spending almost \$12 billion (State of Hawaii Department of Business, Economic Development, and Tourism 2007). The state of Hawaii and the city and county of Honolulu are working to expand their economic base beyond tourism and are encouraging the development of several new innovative and high-tech business industries such as astronomy and space sciences, diversified agriculture, film and digital media, information and communication technologies, and ocean and earth studies (Enterprise Honolulu 2007). Out of a possible 450,171 people in the civilian labor force, 439,852 were employed. The unemployment rate is 2.3%. This was the lowest of any major metropolitan statistical area (MSA) in the United States that year, as tracked by the Bureau of Labor and Statistics (U.S. Department of Labor 2007). Table 7-10 presents historic unemployment statistics for the state of Hawaii and the Honolulu MSA. These fluctuated between 2.3% and 4.1% in the Honolulu MSA but are low when compared with other states and MSAs on the mainland.

**Table 7-10 Percentage of Unemployed in the City of Honolulu  
(2000 – 2006)**

<b>Year</b>	<b>State of Hawaii</b>	<b>City of Honolulu MSA</b>
2000	4.0	3.9
2001	4.2	4.1
2002	4.0	3.9
2003	3.9	3.7
2004	3.2	3.1
2005	2.7	2.6
2006	2.4	2.3

Source: U.S. Department of Labor 2007.

### **7.5.3 Taxes and Revenues**

According to the FY 2006 Comprehensive Annual Financial Report, the total revenue for the city and county of Honolulu government was \$1.42 billion. The majority of this revenue was from taxes (66.2% of the total). Other sources of revenue for the county included charges for services; operating grants and contributions; unrestricted grants and contributions; and capital grants and contributions.

County expenses incurred for FY 2006 totaled \$1.41 billion and primarily included public safety (31.9%), general government (15.4%), and retirement and health benefits (14.3%). Other expenses included cultural and recreational activities, interest, and human services (City and County of Honolulu 2006).

Based upon the FY 2006 budget and the estimated 2005 population for Honolulu County, the local per capita county tax burden is \$1,489.

### **7.5.4 Education**

Public schools serving MCBH Kaneohe Bay include six primary schools in the Kalaheo Complex—Mokapu Elementary, Aikahi Elementary, Kailua Elementary, Kainalu Elementary, Kailua Intermediate, and Kalaheo High School. Mokapu Elementary is the only school located on-base, and 89.3% of the students are military dependents. The percentage of military dependents in the other schools ranges from 12.2% to 23.6% (Madsen August 9, 2007). There were an estimated 4,073 students enrolled in these six schools during the 2006-2007 academic school year and 274 teachers. (The number of teachers is for the 2005-2006 academic year and more recent information is not available at this time [State of Hawaii Department of Education 2007]).

A number of independent, private schools are also available in the Honolulu area. The Hawaii Department of Education receives federal impact aid for military family members attending local public schools and in 2004 had expected to receive \$2,400 annually for each child residing on-base and \$420 dollars for each military child living in off-base housing (Hickam Air Force Base July 2007).

### **7.5.5 Environmental Justice**

Consistent with Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* (February 11, 1994), the Navy's policy is to identify and address disproportionately high and adverse human health or environmental effects of its actions on minority and low-income populations. In addition, Executive Order 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, enacted in 1997, directs federal agencies to identify and assess environmental health and safety risks to children, coordinate research priorities on children's health, and ensure that their standards take into account special risks to children.

This analysis focuses on the potential for a disproportionate and adverse exposure of these specific off-base population groups to the projected aircraft noise under the alternatives at each base where the "greater than 65 DNL noise exposure" would be the largest. The results of the analysis of these scenarios are similar, whether using the alternative with the most squadrons allocated to that base or the least number.

In this analysis, minority and low-income populations and children were defined as follows:

- **Minority.** Individuals who are Black/African-American, Asian, Pacific Islander, American Indian, Eskimo, Aleut, or other non-white persons (a separate distinction has been made for people of Hispanic origin).
- **Low-Income.** Individuals living below the poverty level as defined by the U.S. Census Bureau.
- **Children.** Individuals under the age of 18.

Statistics pertinent to the study area surrounding MCBH Kaneohe Bay are summarized in Table 7-11 below. (Section 8.5.5 presents data on the individual census tracts that would be

most affected by aircraft noise [i.e., all census tracts that are crossed or encompassed by the 65 dB DNL noise contour]).

The geographic areas compared for this environmental justice analysis are Kaneohe and Kailua, the city of Honolulu, Honolulu County (Island of Oahu), and the state of Hawaii. Data from the year 2000 has been used in this analysis because the census tract-level data are not available for any year after 2000.

**Table 7-11 Environmental Justice Statistics for MCBH Kaneohe Bay Analysis (2000)**

	<b>Total Population</b>	<b>Percent Minority</b>	<b>Percent Hispanic</b>	<b>Percent Low-Income</b>	<b>Percent Children</b>
State of Hawaii	1,211,537	75.9	7.2	10.7	24.3
Honolulu County	876,156	78.8	6.7	9.9	23.7
City of Honolulu	371,619	80.5	4.4	11.8	19.1
Kaneohe	34,976	79.7	7.3	6.1	24.6
Kailua	36,585	56.2	5.9	5.4	24.2

Source: U.S. Census Bureau 2000.

## **7.6 Infrastructure and Utilities**

As noted above in the Introduction to this chapter, these resources would not be affected by the proposed action and so are not discussed in this EIS.

## **7.7 Community Services**

As noted above in the Introduction to this chapter, these resources would not be affected by the proposed action and so are not discussed in this EIS.

## **7.8 Transportation**

As noted above in the Introduction to this chapter, transportation would not be affected by the proposed action and so is not discussed in this EIS.

## **7.9 Topography and Soils**

The topography at MCBH Kaneohe Bay is generally flat, with elevations ranging from sea level to approximately 20 feet above sea level (asl) throughout much of the base. The level topography is interrupted by three remnant volcanic features: Kuau (Pyramid Rock), Puu Hawaii Loa, and Ulupa'u crater. Pyramid Rock is an outcropping of a'a lava on the northwest shore of the base with steep slopes at an elevation of approximately 100 feet asl. Puu Hawaii Loa, a cin-

der cone located near the center of the base, also has steep slopes and an elevation of 378 feet asl. The highest point on the base is along the ridgeline of the 683-foot Ulupa'u crater, which covers most of the northeast portion of Mokapu Peninsula. The proposed construction area at the base is level.

Sixteen soil types are mapped within the boundaries of MCBH Kaneohe Bay. Soils on the base range from dense silty clay to fine beach sand. A majority of soils in the eastern two-thirds of the base consist of Mamala Loam, which is a well-drained, relatively young soil developed from coral, lava, and/or alluvium. Most of the western one-third of the base, including the proposed construction area, has been developed on filled land, so native soils are not present in this area.

## **7.10 Water Resources and Wetlands**

### **7.10.1 Surface Water**

MCBH Kaneohe Bay is bound on the west by Kaneohe Bay and on the east by Kailua Bay. Kaneohe Bay is unique in Hawaii because of its intact barrier reef and patch reef network, biological diversity, cultural heritage, and recreational value. The bay is about 8 miles long and 2.7 miles wide with a maximum depth of about 40 feet. With a surface area of 11,000 acres, Kaneohe Bay is the largest sheltered water body in the Hawaiian archipelago. Five islets occur within the Bay: Kapapa Island, Mokolii Island (Chinaman's Hat), Kekepa Island (Turtle Back Rock), Mokuoloe Island (Coconut Island), and Ahu o Laka sand flat (Shafer et al. December 2002). Each of these islets is managed by the State of Hawaii as a seabird sanctuary and supports nesting/and or foraging habitat for dozens of species and thousands of individual birds.

Kailua Bay is banked by a broad sandy beach extending along the MCBH Kaneohe Bay eastern shoreline. A submerged coral reef extends across much of the bay at a depth of approximately 20 feet (see Section 7.11.2). Kailua Bay is used for a variety of recreational activities.

No perennial waterbodies are located on MCBH Kaneohe Bay and freshwater flow is primarily restricted to artificial drainage channels mostly during and shortly after rainstorms. The most prominent surface water features on the base are the Nuupia Ponds complex and Mokapu central drainage channel (see Figure 7-7). The Nuupia Ponds complex consists of eight interconnected ponds that form the southern boundary of MCBH Kaneohe Bay. Four of the ponds



are directly connected with either Kaneohe Bay or Kailua Bay. All of the ponds are shallow, with depths of 2 feet or less (Drigot July 2002). The complex is managed as a 517-acre WMA and includes a mixture of surface water, mudflats, and vegetated buffer zones.

The Mokapu central drainage channel was excavated in a former area of tidally influenced estuarine wetlands in what is now the central portion of MCBH Kaneohe Bay. The channel extends for approximately 1.25 miles from its upper reaches near the southern edge of Klipper golf course to its outlet at Kaneohe Bay. It has an average width of 37 feet and receives fresh water and groundwater runoff from the developed area of the base and is subject to saltwater intrusion from tidal currents (Drigot July 2005).

No natural or artificial surface water features occur on or immediately adjacent to the proposed construction areas at MCBH Kaneohe Bay.

#### **7.10.2 Water Quality**

Surface waters surrounding MCBH Kaneohe Bay are classified and regulated by the state of Hawaii under Title 11, Hawaii Administrative Rules, Department of Health, Chapter 54, Water Quality Standards. The waters of Kaneohe and Kailua Bays are protected by extremely stringent state and federal water quality standards. The inner portions of Kaneohe Bay are designated as Class AA waters. The management objective for these waters is to have them remain in their natural state as nearly as possible with an absolute minimum of pollution or alteration of water quality from any human-caused source or actions (Hawaii Department of Health August 31, 2004). The waters of Kailua Bay and outer portions of Kaneohe Bay are designated Class A waters; they are protected for recreational, wildlife protection, and aesthetic purposes.

The Nuupia Ponds are designated as Class 1 inland waters, which are also to remain in their natural state as nearly as possible with an absolute minimum of pollution or alteration of water quality from any human-caused source or actions. The Mokapu central drainage channel is designated Class 2, Inland Waters (Drigot July 2005).

Roughly 2,200 acres (75%) of MCBH Kaneohe Bay have been developed. The storm water collection system at the base comprises an extensive system of artificial drainage ditches, sewer lines, and box culverts. Storm water is discharged into receiving waters via multiple storm drain outlets: four of the storm drain outlets discharge into Nuupia Ponds, eight discharge into

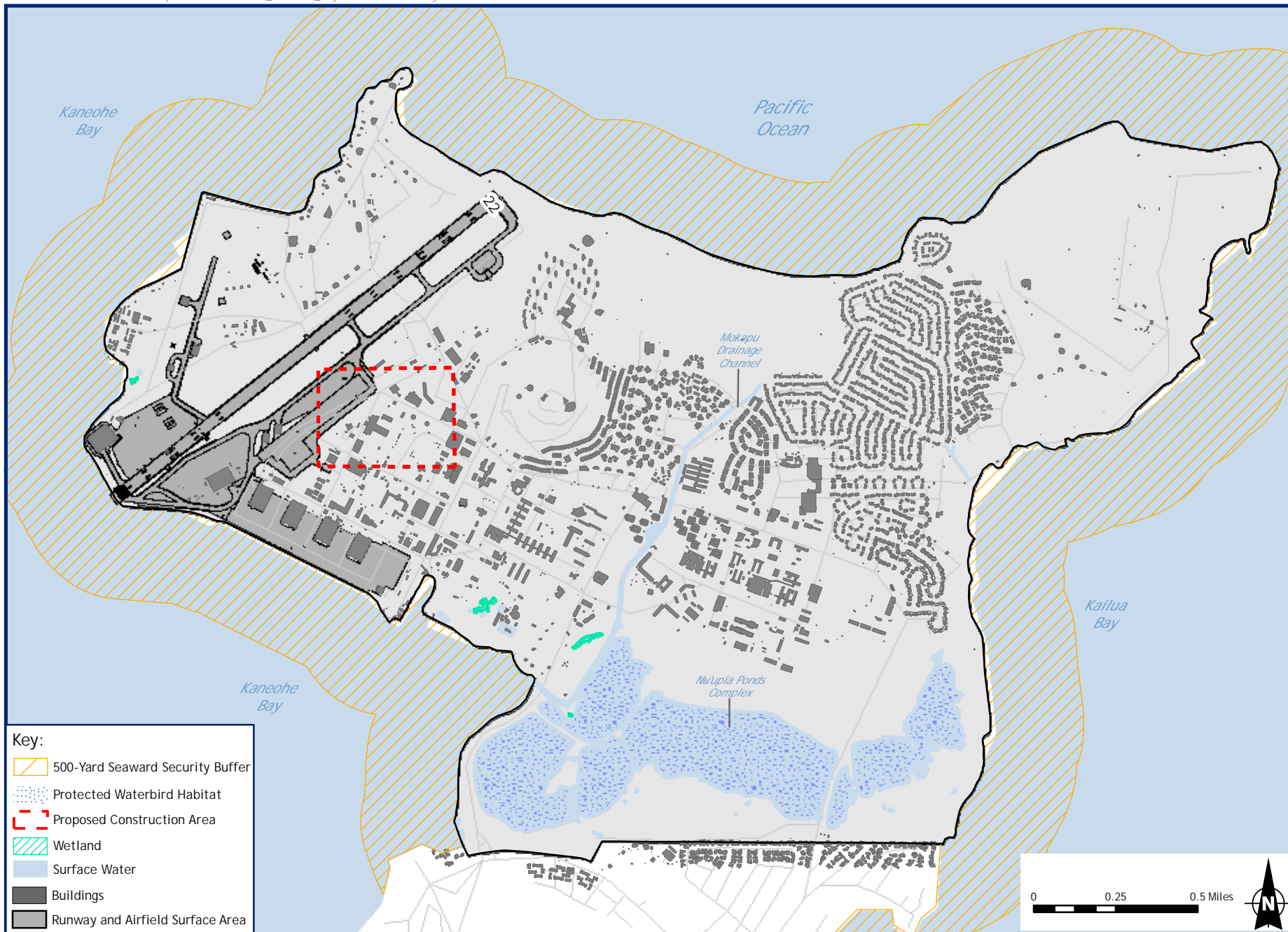


Figure 7-7  
 Natural Resources  
 MCBH Kaneohe Bay, Oahu, Hawaii

Kaneohe Bay, and two discharge into the open ocean. A 4-foot box culvert drains much of the airfield, including the proposed construction area to Kaneohe Bay.

MCBH Kaneohe Bay complies with its National Pollutant Discharge Elimination System (NPDES) permit for the discharge of storm water into surrounding waterbodies. As part of the permit program, MCBH Kaneohe Bay has prepared a Storm Water Management Plan (SWMP) and Storm Water Pollution Prevention Plan (SWPPP) to control storm water discharges from the station that may adversely impact water quality in the surrounding waters. The plans identify potential sources of storm water contamination and present best management practices (BMPs) that are used to prevent or minimize pollutants in storm water. Numerous structural BMPs are employed on-base at industrial and process areas such as vehicle or aircraft maintenance, wash-down, and fueling areas; material storage, loading, and unloading areas; and waste disposal areas that are exposed to storm water. Structural BMPs include erosion and sediment controls, oil/water separators, containment/retention structures, grass-lined swales, and leak detection systems. Non-structural BMPs include preventive maintenance practices, regular inspections, spill prevention and response, procedures and practices for significant materials storage and handling, and regular pavement cleaning to remove oil and grease.

### **7.10.3 Floodplains**

Federal Emergency Management Agency (FEMA)-mapped 100-year floodplains occur along portions of the Kaneohe Bay, Kailua Bay, and Pacific Ocean shorelines, extending inland on the base for up to approximately 1,500 feet (see Figure 7-7). A 100-year floodplain associated with the Mokapu central drainage channel has also been mapped in the central portion of the base. No 100-year floodplains are mapped within the proposed construction area at MCBH Kaneohe Bay.

### **7.10.4 Groundwater**

The groundwater resources beneath the island of Oahu are the result of the infiltration of precipitation through surface soils into permeable rock materials. Groundwater is the principal source of potable water on Oahu and occurs either as high-level groundwater that is perched on top of low-permeability strata or confined within a dike system or as a freshwater basal aquifer. The basal aquifer is the primary source of potable water on Oahu. The freshwater percolates

down through the permeable basalt rocks of the mountains then floats as a lens on the heavier seawater (U.S. Department of the Air Force September 2003).

MCBH Kaneohe Bay lies within the Koolau rift zone, where groundwater is impounded in dike systems that are formed when highly impermeable formations of basalt restrict the flow of groundwater. The Koolau basalt is the principal aquifer on the windward side of Oahu. The exact thickness of groundwater in the Koolau rift zone is not currently known; however, impounded water is thought to extend far below the surface. Groundwater in this region occurs as much as 1,000 feet asl and generally flows from inland areas towards the ocean (U.S. Geological Survey 1999).

A relatively thin layer of surface soil exists at MCBH Kaneohe Bay, and an underlying layer of relatively impermeable rock and sediments provides little depth for groundwater drainage. In addition, the extensive storm water conveyance system on the base significantly restricts groundwater recharge.

MCBH Kaneohe Bay purchases potable water from the City and County of Honolulu Board of Water Supply (Drigot et al. November 2001). Groundwater is pumped to the base from multiple wells. The groundwater is chlorinated, fluoridated, and tested once it enters the base water system (Drigot et al. November 2001).

#### **7.10.5 Wetlands**

Executive Order 11990, *Protection of Wetlands*, requires that federal agencies adopt a policy to avoid to the extent possible the long- and short-term adverse impacts associated with the destruction and modification of wetlands and to avoid the direct and indirect support of new construction in wetlands whenever there is a practicable alternative.

Field delineations of jurisdictional wetland boundaries at MCBH Kaneohe Bay were completed during 2001-2002. These surveys showed seven wetlands/wetland complexes covering 128 acres on the base. The wetlands are predominantly freshwater communities associated with the Nuupia Ponds complex. No wetlands were mapped within or directly adjacent to the proposed construction area at the base (Drigot et al. November 2001). A field reconnaissance of the construction area completed in January 2007 confirmed the absence of wetlands in the area.

## **7.11 Biological Resources**

### **7.11.1 Vegetation**

Vegetated areas at MCBH Kaneohe Bay are composed primarily of native sea strand vegetation along dunes and coastlines and non-native vegetation in the Nuupia Ponds and Ulupa'u Head WMAs. Vegetation in the Nuupia Ponds WMA is dominated by invasive pickleweed, while invasive grassland species are dominant in the Ulupa'u Head WMA. Vegetation cover in the remainder of the base is dominated by non-native species, typically Bermuda grass, and a variety of trees and shrubs. The proposed construction area at MCBH Kaneohe Bay consists of a mixture of paved land and maintained Bermuda grass (Drigot et al. November 2001).

### **7.11.2 Wildlife**

Wildlife at MCBH Kaneohe Bay is most concentrated along the base's 11 miles of shoreline, within the Nuupia Ponds and Ulupa'u Head WMAs, and within the 500-yard buffer zone around Mokapu Peninsula. More than 50 different species of waterbirds, migratory shorebirds, and seabirds have been recorded along the MCBH Kaneohe Bay shoreline and within the Nuupia Ponds WMA. Sixteen native fish species inhabit the Nuupia Ponds WMA. A population of approximately 3,000 red-footed boobies (*Sula sula rubripes*) nest in a colony in the 25-acre Ulupa'u Head WMA; this colony is one of two red-footed booby colonies in the main Hawaiian Islands and has been active since the 1940s (Drigot et al. November 2001).

The 500-yard seaward buffer zone supports diverse populations of native and transient aquatic wildlife species. Coral reef colonies occur throughout the zone, with coral species type and abundance varying based on wave conditions, freshwater input, and bathymetry. The highest coral coverage is believed to be offshore of the northwest end of Mokapu Peninsula and offshore of Ulupa'u Head. In addition, some portions of Kailua Bay have coral coverage of up to 50% (Shafer et al. 2002). Abundant populations of estuarine and marine fish, algae, sponges, and invertebrates also inhabit the marine waters surrounding MCBH Kaneohe Bay (Shafer et al. December 2002).

Studies have recently been completed to inventory marine species in the 500-yard seaward security buffer zone (Shafer et al. December 2002; Marine Corps Base Hawaii November 2006). Numerous sensitive resources have been identified in the area, including important bryo-

zoan habitat; common habitat for the endemic squid; an area of good finger coral; a portion of an area used by hammerhead sharks for pupping; coral colonies with high conservation value; an area dominated by finger coral that also supports a high diversity of other corals; an area of elk-horn coral; an area used by turtles for grazing; culturally important seaweeds; and a native seagrass meadow (Shafer et al. December 2002; Marine Corps Base Hawaii November 2006).

#### **7.11.2.1 Migratory Birds**

The Migratory Bird Treaty Act (MBTA) is the primary legislation in the United States established to conserve migratory birds. The MBTA prohibits the taking, killing, or possessing of migratory birds unless permitted by regulation. Under 50 CFR Part 21, the Armed Forces are authorized to take migratory birds during military readiness activities; however, the Armed Forces must confer and cooperate with the U.S. Fish and Wildlife Service (USFWS) on the development and implementation of conservation measures to minimize or mitigate adverse effects of military readiness activities if it determines that such activity may have a significant adverse effect on a population of migratory birds. Congress has defined military readiness as all training and operations of the Armed Forces that relate to combat and the adequate and realistic testing of military equipment, vehicles, weapons, and sensors for proper operation and suitability for combat use. An activity has a significant adverse effect if, over a reasonable period of time, it diminishes the capacity of a population of a migratory bird species to maintain genetic diversity, to reproduce, and to function effectively in its native ecosystem.

Military readiness activities do not include routine operation and maintenance of the aircraft at the airfield or construction of support infrastructure. These operations are considered non-military readiness activities. Migratory bird conservation relative to non-military readiness activities is addressed separately in a Memorandum of Understanding (MOU) developed in accordance with Executive Order 13186, signed January 10, 2001, “*Responsibilities of Federal Agencies to Protect Migratory Birds*.” The MOU, between the DoD and the USFWS, outlines the responsibility of federal agencies to protect migratory birds and how to incorporate conservation efforts into their routine operations and construction activities.

More than 30 species of migratory birds have been recorded on MCBH Kaneohe Bay (Drigot et al. November 2001). Prominent migratory bird species observed at the base include

great frigate birds (iwa or *Fregata minor palmerstoni*), native black-crowned night herons (au-kuu or *Nycticorax nycticorax hoactli*), and Pacific golden plovers (kolea or *Pluvialis fulva*).

#### **7.11.2.2 Bird-Aircraft Strike Hazards**

The presence of resident and migratory birds creates a bird-aircraft strike hazard (BASH) risk at MCBH Kaneohe Bay. The airfield's proximity to marine waters and several large hangars and the expanses of grass adjacent to the airfield enhances the BASH risk. MCBH Kaneohe Bay has prepared a BASH plan to reduce the potential for collisions between aircraft and birds or other animals. The BASH plan prescribes an ongoing process that involves the distribution of information and active and passive measures to control how birds use the critical areas around the airfield. Methods outlined in the plan to reduce BASH hazards at the airfield include habitat management, bird dispersal and depredation, and bird avoidance (Drigot et al. November 2001).

#### **7.11.3 Threatened and Endangered Species**

The ESA of 1973 and subsequent amendments provide for the conservation of threatened and endangered species of animals and plants and the habitats in which they are found. The Navy ensures that consultations are conducted as required under Section 7 of the ESA for any action that "may affect" a federally listed threatened or endangered species. The Navy encourages the protection of species listed at the state level as threatened or endangered as practicable and consistent with the mission.

The USFWS Pacific Islands Fish and Wildlife Office, the National Marine Fisheries Service (NMFS) Pacific Islands Regional Office, and the Hawaiian Natural Heritage Program were contacted to obtain updated information on protected species on and within the vicinity of MCBH Kaneohe Bay. Each of these agencies maintains databases to track the occurrence of threatened and endangered species.

This recent agency consultation indicated that federally listed threatened and endangered animal species occurring within or in the immediate vicinity of MCBH Kaneohe Bay and adjacent waters are the Hawaiian monk seal (*Monachus schauinslandi*), humpback whale (*Megaptera novaeangliae*), sperm whale (*Physeter catodon* [*P. macrocephalus*]), Hawaiian hoary bat (*Lasiurus cinereus semotus*), Hawaiian stilt (aeo or *Himantopus mexicanus knudseni*), Hawaiian common moorhen (Hawaiian gallinule, alae ula, or *Gallinula chloropus sandvicensis*), Hawaiian

coot (alae keokeo or *Fulica americana alai*), Hawaiian duck (koloa moali or *Anas wyvilliana*), Newell's shearwater (*Puffinus auricularis newelli*), green sea turtle (*Chelonia mydas*), and hawksbill turtle (*Eretmochelys imbricata*) (Leonard July 6, 2007; Yates May 31, 2007). Federally listed threatened and endangered plant species occurring within or in the immediate vicinity of MCBH Kaneohe Bay are the round-leaved chaff-flower (*Achyranthes splendens* var. *rotundata*), Puukaa (*Cyperus trachysanthos*), white hibiscus (*Hibiscus arnottianus* ssp. *immaculatus*), yellow hibiscus (*Hibiscus brackenridgei*), Loulu palm (*Prichardia kaalae*), and Ohai (*Sesbania tomentosa*). The current federal protection status of each of these species is indicated in Table 7-12. Hawaiian names have been provided for each species where applicable.

**Table 7-12 Federally Protected Species and Species of Concern that May Occur at or in the Vicinity of MCBH Kaneohe Bay**

Category	Species Common Name	Species Scientific Name	Status	
			Federal	State
Federal Threatened and Endangered Species				
Mammals	Hawaiian monk seal ( lio-holo-i-ka-uaua)	<i>Monachus schauinslandi</i>	E; MMPA	E
	Humpback whale (Kohol )	<i>Megaptera novaeangliae</i>	E; MMPA	E
	Sperm whale	<i>Physeter catodon</i> ( <i>P. macrocephalus</i> )	E; MMPA	E
	Hawaiian hoary bat ( peapea)	<i>Lasiurus cinereus semotus</i>	E	E
	Short-finned pilot whales	<i>Globicephalus macrorhynchus</i>	MMPA	–
	Hawaiian spinner dolphins	<i>Stenella longirostris</i>	MMPA	–
Birds	Hawaiian stilt (Aeo)	<i>Himantopus mexicanus knudseni</i>	E	E
	Hawaiian common moorhen (Hawaiian gallinule or Alae ula)	<i>Gallinula chloropus sandvicensis</i>	E	E
	Hawaiian coot (Alae keokeo)	<i>Fulica americana alai</i>	E	E
	Hawaiian duck (Koloa moali)	<i>Anas wyvilliana</i>	E	E
	Newell’s shearwater (Ao)	<i>Puffinus auricularis newelli</i>	T	T
Reptiles	Green sea turtle (Honu)	<i>Chelonia mydas</i>	T	T
	Hawksbill turtle	<i>Eretmochelys imbricate</i>	E	E
Plants <sup>1</sup>	Round-leaved chaff-flower (Ewa hinahina)	<i>Achyranthes splendens</i> var. <i>rotundata</i>	E	–
	Puukaa	<i>Cyperus trachysanthos</i>	E	–
	White hibiscus (Kokio keokeo)	<i>Hibiscus arnottianus</i> ssp. <i>immaculatus</i>	E	–
	Yellow hibiscus (Mao hau hele)	<i>Hibiscus brackenridgei</i>	E	–
	Loulu palm	<i>Pritchardia kaalae</i>	E	–
	Ohai	<i>Sesbania tomentosa</i>	E	–



**Table 7-12 Federally Protected Species and Species of Concern that May Occur at or in the Vicinity of MCBH Kaneohe Bay (continued)**

Category	Species Common Name	Species Scientific Name	Status	
			Federal	State
Other Species of Concern <sup>2</sup>				
Birds	Short-eared owl (Pueo)	<i>Asio flammeus sandwichensis</i>	–	E
Invertebrates	Hawaiian reef coral	<i>Montipora dilatata</i>	FSC	–
	Inarticulated brachiopod	<i>Lingula reevii</i>	FSC	–

Source: Leonard July 6, 2007; Yates May 31, 2007.

Notes:

<sup>1</sup> Endangered plant species do not occur in natural populations at MCBH Kaneohe Bay. The species listed occur only in cultivated settings at the base.

<sup>2</sup> These species are not protected under federal law.

Status Codes:

E = Endangered.

FSC = Federal Species of Concern.

MMPA = Marine Mammal Protection Act.

T = Threatened

– = Not Listed

### **7.11.3.1 Hawaiian Monk Seal (Īlio-holo-i-ka-uaua)**

Hawaiian monk seals (*Monachus schauinslandi*) are the only endangered marine mammal that occurs exclusively within the United States. The majority of the monk seal population occurs in the northwestern Hawaiian Islands; the species is found in lower numbers in the main Hawaiian Islands, which includes Oahu. Most of the monk seals in the main Hawaiian Islands are located on or near a small privately owned island (Niihau Island) approximately 150 miles northwest of Oahu. During aerial surveys of the main Hawaiian Islands in 2000-2001, only one monk seal was sighted on Oahu (National Marine Fisheries Service 2007). Since then, Hawaiian monk seals have infrequently been seen resting along the Pacific Ocean shoreline beaches on either side of Pyramid Rock at the northwest corner of MCBH Kaneohe Bay (Marine Corps Base Hawaii November 2006). Additionally, on April 6, 1996, a monk seal was observed giving birth along the beach just northwest of Pyramid Rock (Drigot et al. November 2001).

### **7.11.3.2 Humpback Whale (Koholā)**

Humpback whales are present in Hawaiian waters between December and April, although individuals may also be present from September through June. Humpbacks use Hawaiian waters for breeding and little feeding is thought to occur when they are in the area. The majority of humpback whales in Hawaiian waters are found east of MCBH Kaneohe Bay in the area between

the islands of Maui Nui and on Penguin Banks off Molokai (Hawaii Department of Fish and Wildlife 2007e). In the vicinity of MCBH Kaneohe Bay, migrating humpback whales occur in deeper offshore waters during winter months, often coming close to shore at Pyramid Rock Beach (U.S. Department of the Navy June 2002).

The Hawaiian Islands Humpback Whale National Marine Sanctuary was designated as such by Congress in the Hawaiian Islands National Marine Sanctuary Act on November 4, 1992 (Subtitle C of Public Law 102-587, the Oceans Act of 1992). The sanctuary was established to protect humpback whales and their habitat within the sanctuary, educate the public on the relationship of humpback whales to the Hawaiian Islands marine environment, and to manage human uses of the sanctuary. Covering 1,370 square miles, the sanctuary is a series of five noncontiguous protected marine areas distributed across the main Hawaiian Islands. The largest contiguous portion of the sanctuary is designated around the islands of Molokai, Maui, and Lanai. The sanctuary also includes four smaller areas: waters off the north shore of Kauai, Hawaii's Kona coast, and the north and southeast coasts of Oahu. No waters adjacent to or within 5 miles of MCBH Kaneohe Bay are designated as part of the sanctuary (National Oceanic and Atmospheric Administration August 2002).

#### **7.11.3.3 Sperm Whale**

Sperm whales (*Physeter catodon* [*P. macrocephalus*]) are present offshore of all the main Hawaiian Islands. The primary habitat for this species is deep water of at least 3,300 feet, although they can sometimes be found closer to shore near steep drop-offs. Sperm whales are often found near areas with distinct oceanographic features such as the edges of continental shelves, large islands, offshore banks, or submarine trenches and canyons (Hawaii Department of Fish and Wildlife 2007a). No critical habitat has been designated for the sperm whale in the waters adjacent to MCBH Kaneohe Bay.

#### **7.11.3.4 Hawaiian Hoary Bat (Ōpeapea)**

The Hawaiian hoary bat (*Lasiurus cinereus semotus*) is Hawaii's only native terrestrial mammal. This species primarily roosts in native and non-native vegetation at heights of 3 to 29 feet above the ground. Rare occurrences of roosting in lava tubes, cracks in rocks, and man-

made structures have also been observed. Watercourses and edge habitats are considered important foraging areas for the hoary bat (Hawaii Department of Fish and Wildlife 2007b).

The Hawaiian hoary bat has been reported from all the middle Hawaiian Islands except Niihau. Observations of this species on Oahu are rare and the Hawaiian hoary bat has been seen mostly on the southeast end of the island. On Oahu, hoary bats have been recorded in coastal habitats (0 to 100 feet asl) and also at the summits of the Koolau Range (up to 2,930 feet asl). There are no incidental records of hoary bats on the Mokapu Peninsula and this species has not been documented at MCBH Kaneohe Bay during natural resources surveys (Hawaii Department of Fish and Wildlife 2007b; Marine Corps Base Hawaii November 2006).

#### **7.11.3.5 Hawaiian Stilt, Hawaiian Common Moorhen, Hawaiian Coot, and Hawaiian Duck**

The Hawaiian stilt, Hawaiian common moorhen, Hawaiian coot, and Hawaiian duck are waterbirds that generally occur in coastal plain wetlands. The Nuupia Ponds WMA on MCBH Kaneohe Bay is an important breeding area for the Hawaiian stilt. The population of this species on the base was systematically counted once per week during 2006 and ranged from 67 to 159 birds. The Nuupia Ponds WMA is also an important foraging area for Hawaiian common moorhen, Hawaiian coot, and Hawaiian duck (Marine Corps Base Hawaii November 2006).

#### **7.11.3.6 Newell's Shearwater (Ao)**

Newell's shearwater (*Puffinus auricularis newelli*) is a highly pelagic species native to the Hawaiian Islands. The majority of breeding takes place on Kauai, with additional breeding colonies located on Hawaii, Molokai, and tiny Lehua (off the north coast of Niihau). Newell's shearwaters may also breed on Oahu, Maui, and Lanai, but breeding colonies have not been confirmed on these islands. Colonies are usually located on steep slopes such as coastal cliffs or cinder cones in areas of open native forest dominated by hia (*Metrosideros polymorpha*) with a dense understory of uluhe fern (*Dicranopteris linearis*). Newell's shearwaters commonly forage in large, mixed-species flocks associated with schools of predatory fish that drive prey species close to the surface. Newell's shearwaters feed by "pursuit-plunging"—diving into the water and swimming after prey; their diet is not well known but likely consists of fish and squid (Hawaii Department of Fish and Wildlife 2007c). There are no recorded breeding colonies for this

species at MCBH Kaneohe Bay. However, Newell's shearwater is recorded as occurring at the base and so would likely forage in adjacent waters (Marine Corps Base Hawaii November 2006).

#### **7.11.3.7 Green Sea Turtle (Honu) and Hawksbill Sea Turtle**

Green sea turtles (*Chelonia mydas*) can be found in the waters around all the Hawaiian Islands. Important foraging areas are located along the coastlines of Oahu, Molokai, Maui, Lanai, Hawaii, and in the Northwest Hawaiian Islands, Lisianski Island, Pearl and Hermes Reef, and Kure Atoll. Though some nesting occurs on all the islands, 90% of the nesting occurs on the French Frigate Shoals in the Northwestern Hawaiian Islands (Hawaii Department of Fish and Wildlife 2007d).

Hawksbill turtles (*Eretmochelys imbricata*) are rarely found in the waters around the main Hawaiian Islands. Nesting occurs only on the main islands, especially along the eastern coast of Hawaii. A black-sand beach in the Halawa River Valley on the eastern shore of Molokai and Kamehame Beach on Hawaii are also used consistently, while a few beaches on Maui are used only occasionally (Hawaii Department of Fish and Wildlife 2007f).

No sea turtle nesting has been documented on any MCBH Kaneohe Bay beaches. However, sea turtles are commonly seen swimming and feeding within the MCBH Kaneohe Bay 500-yard seaward buffer zone (Marine Corps Base Hawaii November 2006).

#### **7.11.3.8 Round-leaved Chaff-flower (Ewa hinahina)**

Round-leaved chaff-flower (*Achyranthes splendens* var. *rotundata*) is a small shrub, ranging in height from 2 to 6 feet, with oval leaves and small flowers closely spaced on spikes that form at the ends of the branches (University of Hawaii at Manoa College of Tropical Agriculture and Human Resources August 19, 2001). This species occurs on Maui, Molokai, Lanai, and Oahu at low elevations in open, dry forest remnants and thickets, on rocky slopes, and on plains composed of emerged coral reef with calcareous substrates. Natural occurrences of round-leaved chaff-flower have not been documented on MCBH Kaneohe Bay. However, this species has recently been planted in some cultivated settings at the base (Marine Corps Base Hawaii November 2006).

#### **7.11.3.9 Puukaa**

Puukaa (*Cyperus trachysanthos*), a short-lived, perennial, grass-like plant with a short rhizome, occurs on Niihau, Kauai, and Oahu. Puukaa is usually found at elevations between 20 feet and 6,363 feet in seasonally wet habitats such as mud flats, wet clay soil, seasonal ponds, and wet cliff seeps, or on seepy flats, coastal cliffs, or rocky slopes. Puukaa does not occur naturally at MCBH Kaneohe Bay; however, this species has recently been planted in some cultivated settings at the base (Marine Corps Base Hawaii November 2006).

#### **7.11.3.10 White Hibiscus (*Kokio keokeo*)**

White hibiscus (*Hibiscus arnottianus* ssp. *immaculatus*) is a long-lived perennial tree that grows up to 10 feet tall and is distinguished from other Hawaiian hibiscus species by its white petals and staminal column. White hibiscus occurs naturally on Molokai and can be found along steep sea cliffs in mesic forests at elevations of between 26 and 3,326 feet. Natural occurrences of white hibiscus have not been documented on MCBH Kaneohe Bay. However, this species has recently been planted in some cultivated settings at the base (Marine Corps Base Hawaii November 2006).

#### **7.11.3.11 Yellow Hibiscus (*Mao hau hele*)**

Yellow hibiscus (*Hibiscus brackenridgei*) is a perennial, sprawling to erect shrub or small tree that flowers continuously from early February through late May and irregularly throughout the rest of the year. Yellow hibiscus currently occurs on Oahu, Lanai, Maui, and Hawaii, and possibly Kauai. On Oahu, yellow hibiscus can be found on slopes, cliffs, and ledges in lowland dry forest and shrubland at 79 to 1,607 feet elevation. Natural occurrences of yellow hibiscus have not been documented at MCBH Kaneohe Bay. However, this species has recently been planted in some cultivated settings at the base (Marine Corps Base Hawaii November 2006).

#### **7.11.3.12 Loulu Palm**

Loulu palm (*Prichardia kaalae*), a single-stemmed palm growing up to 16 feet tall, can be found in moist forests and shrublands, gulch bottoms and slopes, and also on steep ridge sides and cliffs at elevations of 1,500 to 3,100 feet. Loulu palm does not occur naturally at MCBH

Kaneohe Bay; however, this species has recently been planted in some cultivated settings at the base (Marine Corps Base Hawaii November 2006).

#### **7.11.3.13 Ohai**

Ohai (*Sesbania tomentosa*) is a shrub with branches up to 46 feet long that lie along the ground, although this species sometimes occurs as a small tree 8 to 20 feet tall. Ohai most frequently can be found in coastal habitats and less often inland; its habitats include calcareous beaches and sand dunes, rocky ridges and slopes, soil pockets on lava, dry shrublands and, rarely, dry forests. Ohai currently occurs on Oahu, Molokai, Maui, Kauai, Kahoolawe, Hawaii, and Nihoa and Necker in the Northwest Hawaiian Islands. Natural occurrences of ohai have not been documented at MCBH Kaneohe Bay. However, this species has recently been planted in some cultivated settings at the base (Marine Corps Base Hawaii November 2006).

#### **7.11.3.14 Other Species of Concern**

Other species of concern on or in the immediate vicinity of MCBH Kaneohe Bay include the short-eared owl, Hawaiian reef coral, and the inarticulated brachiopod. The current protection status of each of these species is indicated in Table 7-12. The short-eared owl is found on all main Hawaiian Islands; it occurs in a variety of habitats but most often is found in open habitats such as grasslands and shrublands. This species has been documented as occurring on MCBH Kaneohe Bay (Drigot et al. November 2001). The Hawaiian reef coral and inarticulated brachiopod are both known to occur in the waters of Kaneohe Bay (Yates May 31, 2007).

#### **7.11.4 Marine Mammals**

The Marine Mammal Protection Act (MMPA) is administered by the USFWS and the National Oceanic and Atmospheric Administration (NOAA) to protect and manage marine mammals. Species protected under the MMPA known to occur in the marine waters adjacent to MCBH Kaneohe Bay include the Hawaiian monk seal, humpback whale, sperm whale, short-finned pilot whale, and Hawaiian spinner dolphin.

### **7.12 Cultural Resources**

The 1966 NHPA, Public Law 89-665, as amended by Public Law 96-515, 16 U.S.C. 470 et seq., establishes the National Register of Historic Places (NRHP), which includes historic

properties such as districts, sites, buildings, structures, and objects that are significant in American history, architecture, archaeology, and culture. Section 106 of the NHPA requires that federal agencies with jurisdiction over a proposed federal project take into account the effect of undertakings on cultural resources listed, or eligible for listing, on the NRHP, and affords the State Historic Preservation Office (SHPO) and the Advisory Council on Historic Preservation (ACHP) an opportunity to comment with regard to an undertaking. The NRHP eligibility criteria are defined by the Secretary of the Interior's Standards for Evaluation (36 CFR 60).

A National Register resource is a building, structure, site, district, or object that is included in or eligible for inclusion in the NRHP. Properties that qualify for the NRHP must generally be at least 50 years old; possess integrity of location, design, setting, materials, workmanship, feeling, and association; and meet one or more of the following criteria:

- **Criterion A.** Properties associated with events that have made a significant contribution to the broad patterns of our history;
- **Criterion B.** Properties associated with the lives of persons significant in our past;
- **Criterion C.** Properties that embody the distinctive characteristics of a type, period, or method of construction; or
- **Criterion D.** Properties that have yielded, or may be likely to yield, information important in prehistory or history (36 CFR 60.4).

The Marine Corps has conducted numerous inventories of cultural resources at MCBH Kaneohe Bay to identify properties that are listed or potentially eligible for listing in the NRHP. The results of these studies and proposed mitigation measures have been summarized in the base's Integrated Cultural Resources Management Plan.

#### **7.12.1 Architectural Resources**

MCBH Kaneohe Bay Hawaii has 478 buildings and structures built before 1960; 236 of these buildings have been determined to be eligible for listing in the NRHP. Building 101, the Maintenance Hangar, located south of the airfield, and the adjacent seaplane ramps extending into Kaneohe Bay are listed on the NRHP and classified as National Historic Landmarks. The concrete and steel hangar was built in 1941 and covers approximately 98,044 square feet. The hangar was bombed and set on fire during the December 7, 1941 attack on Pearl Harbor (Will Chee Planning and Environmental, Inc. 2006).

None of the structures at the base proposed for demolition or renovation as part of the proposed action have been listed on the NRHP or are considered eligible for listing, as identified in the *Marine Corps Base Hawaii, Kaneohe Bay Historic Building Inventory* (Fung Associates with Mason Architects, Inc. 2005). MCBH Kaneohe Bay has initiated consultation with the Hawaii SHPO to obtain their concurrence on the findings and appropriate determination of any potential effects.

### **7.12.2 Archaeological Resources**

Fifty-two archaeological sites have been recorded at MCBH Kaneohe Bay; 30 of these sites have been determined to be eligible for listing on the NRHP. One site, the Mokapu Burial Area, has been listed on the NRHP. The site includes three main burial clusters located from west to east along the north coast of the Mokapu Peninsula. The burial area has yielded more than 1,500 sets of human remains (Marine Corps Base Hawaii November 2006).

Previous archaeological projects have identified one archaeological site in the vicinity of the proposed construction areas at MCBH Kaneohe Bay: Site 4933, located on a former sand berm, contains traditional Hawaiian cultural materials. The site is located on an existing aircraft parking apron. Inadvertent discoveries of human remains have also been identified within sandy fill material used in utility trenches (ca. 1940s) located in the construction area.

In addition to the documented occurrences of archaeological sites, MCBH Kaneohe Bay has been divided into archaeologically sensitive zones (see Figure 7-8). The zones are designated as high, medium, low, or low-fill: high sensitivity zones are locales where significant archaeological sites are known to exist and there is a high probability that other cultural resources are present; medium sensitivity zones are areas where sites are known to exist but the probability of encountering cultural resources is slight; low sensitivity zones are areas where no cultural resources have been found and there is almost no probability of encountering cultural resources; and low-fill sensitivity zones are areas of filled land that have almost no probability of encountering cultural resources.

The proposed MMA P-8A construction area is located in a medium archaeologically sensitive zone that originally consisted of sand and silt derived from a coastal beach and marshy area (Will Chee Planning and Environmental, Inc. May 2006).



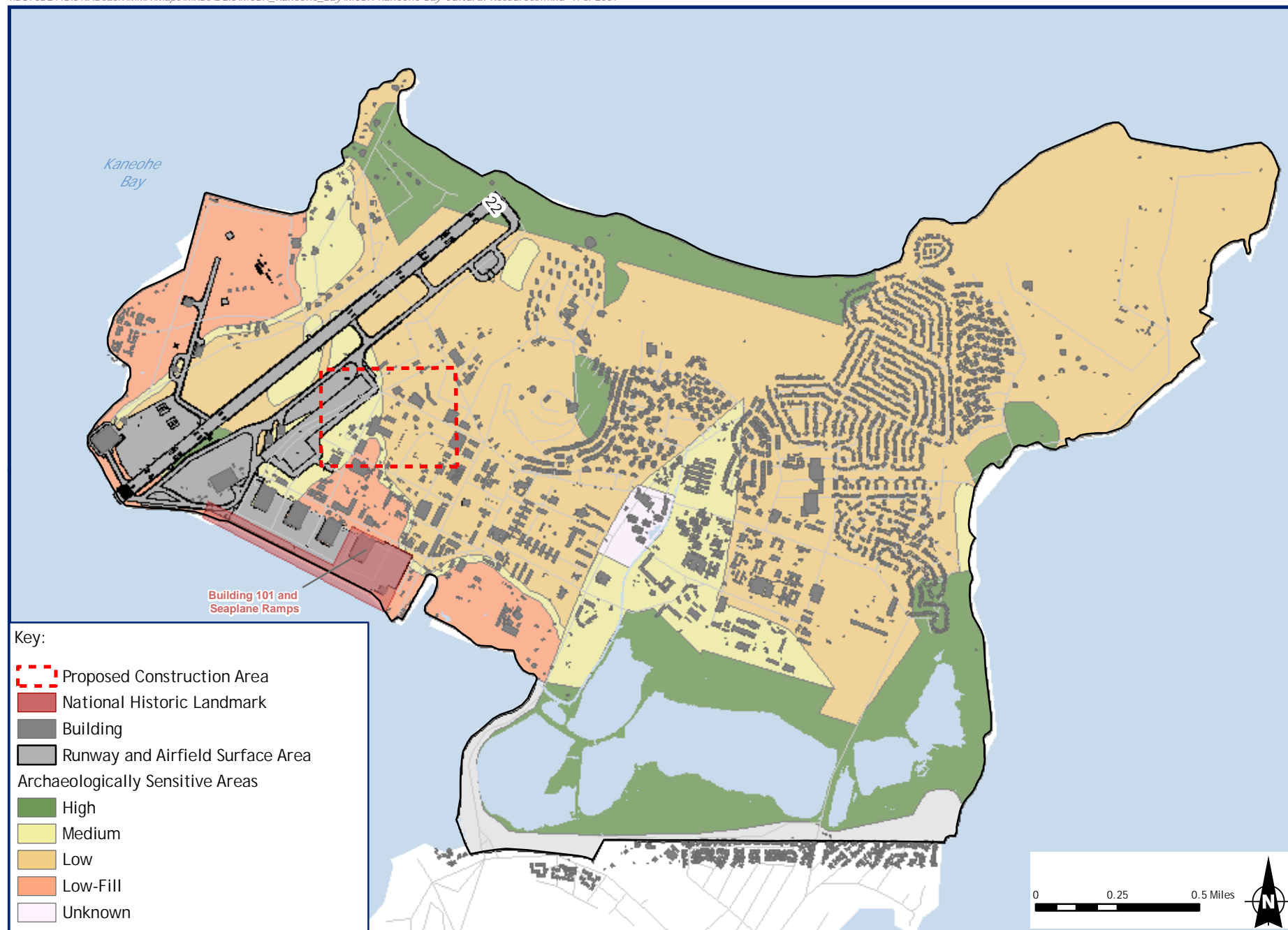


Figure 7-8  
 Archaeologically Sensitive Areas  
 MCBH Kaneohe Bay, Hawaii

Because the proposed construction areas are near known archaeological sites and archaeologically sensitive areas, the Navy will initiate an archaeological inventory survey to identify any cultural materials, deposits, or archaeological features within the areas of disturbance. Section 8.12 provides additional details on the planned survey methodology and coordination with the Hawaii SHPO.

## **7.13 Environmental Management**

### **7.13.1 Hazardous Materials and Waste Management**

A variety of hazardous materials are used at MCBH Kaneohe Bay, including petroleum, oils, and lubricants (POLs); solvents and thinners; caustic cleaning compounds and surfactants; cooling fluids (antifreeze); adhesives; acids and corrosives; paints; and herbicides, pesticides, and fungicides. Hazardous materials are used for aircraft and vehicle repair and maintenance activities at MCBH Kaneohe Bay. Hazardous waste-generating activities include painting, using solvents for cleaning and degreasing, mechanical and chemical paint and rust removal, fluids change-out, electroplating, metal casting, machining, and welding or soldering. If not consumed during use, these materials (and possibly their containers) eventually may be disposed of as solid or hazardous waste.

The DoD collects all annual hazardous- and solid-waste generation data for each Navy, Marine Corps, and Air Force installation in order to track its progress in meeting its goals for waste reduction. Waste categories in the Pollution Prevention Annual Data Summary are defined by the source of the waste such as the plating shop (electroplating and circuit-board manufacturing processes), fluids change (i.e., used solvents, hydraulic fluids, lubricants), facility operations (i.e., cleaning and maintenance, pest-management applications, used batteries), chemical paint stripping, painting operations, and rust and coating removal.

MCBH Kaneohe Bay is a large-quantity generator of hazardous waste, as defined by the Resource Conservation and Recovery Act (RCRA), a status that applies to facilities generating 2,200 pounds (1,000 kilograms [kg]) or more of hazardous waste. In FY 2006 (October 1, 2005 to September 30, 2006), MCBH Kaneohe Bay generated slightly more than 100,000 pounds of hazardous waste.

### **7.13.2 Installation Restoration Program (IRP) Sites**

Hazardous-waste disposal sites at MCBH Kaneohe Bay have been investigated under the DoD's Installation Restoration Program in compliance with the requirements of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) for former waste sites and with RCRA for sites associated with continuing operations.

MCBH Kaneohe Bay manages IRP sites where releases of hazardous materials or petroleum products have resulted in remediation or other follow-up efforts. MCBH Kaneohe Bay has 25 sites in various stages of investigation and remediation under either the IRP or the Munitions Response Program. There are no sites within the proposed project construction area, although there is one site just outside (to the southwest) of the proposed hangar construction area. Between the Tactical Support center (TSC) building location and the proposed hanger construction area is a former aircraft fuel dispensing station spill, at Building 368. This IRP site is classified as "no further action recommended." The two additional sites, approximately 200 and 400 feet away respectively, are the next closest IRP sites to any proposed construction locations. These sites are a MAC Squadron 24 Building just south of the existing aircraft parking apron and a former aircraft fuel spill (JP-5 fuel tank spill just southwest of the training facilities). The remedial action for the MAC Squadron 24 Building has been completed and is now classified as "no further action recommended." The JP-5 fuel tank spill is classified as "further action recommended."

## 8 Environmental Consequences: MCBH Kaneohe Bay

MCBH Kaneohe Bay is a site for replacing P-3C aircraft with P-8A MMA under Alternatives 1 through 6. The following is a brief summary of aircraft replacements at MCBH Kaneohe Bay proposed under each alternative. As noted in Section 2, Alternative 5 is the preferred alternative.

- **Alternatives 1, 5 (Preferred Alternative), and 6.** Three fleet squadrons would be stationed at MCBH Kaneohe Bay. P-8A MMA personnel would number 904, representing a loss of 737 when compared with the number of P-3C personnel.
- **Alternative 2.** A permanent squadron detachment would be stationed at MCBH Kaneohe Bay. P-8A MMA personnel would number 99, representing a loss of 1,542 when compared with the number of P-3C personnel.
- **Alternatives 3 and 4.** Two fleet squadrons would be stationed at MCBH Kaneohe Bay. P-8A MMA personnel would number 639, representing a loss of 1,002 when compared with the number of P-3C personnel.

Discussions of potential environmental impacts associated with all alternatives at MCBH Kaneohe Bay are included in this section. Section 1 of this EIS defines 2011 as the baseline year for the analysis presented in this EIS because it is the year prior to the introduction of the P-8A MMA. However, in a few instances the best available data was available only for an alternate year, ranging from 2010 to 2013. In such instances, where data from a year other than 2011 were used to support the analysis, the year and data source are specifically identified within the text. The baseline also defines the No Action Alternative conditions. Tables 8-1, 8-2, and 8-3 are provided to guide the evaluation of proposed environmental impacts. The sites for proposed new construction at MCBH Kaneohe Bay are shown in Figures 2-10, 2-11, and 2-12 in Section 2, Proposed Action and Alternatives.

**Table 8-1 Baseline (2011) and Projected (2019) Personnel Loading at MCBH Kaneohe Bay**

	<b>Baseline (2011)</b>	<b>Alternatives 1, 5, and 6</b>	<b>Alternative 2</b>	<b>Alternatives 3 and 4</b>
<b>Personnel</b>				
P-3C	1, 641	0	0	0
P-8A MMA	0	904	99	639
<b>Net Change</b>	<b>–</b>	<b>(-)737</b>	<b>(-)1,542</b>	<b>(-)1,002</b>

**Table 8-2 Projected Areas of Impact from New Construction at MCBH Kaneohe Bay**

<b>Proposed New Construction</b>	<b>Alternatives 1, 5, and 6</b>	<b>Alternative 2</b>	<b>Alternatives 3 and 4</b>
Training Facilities	38,162 sq. ft.	-	38,162 sq. ft
Privately owned vehicle (POV) Parking	72,522 sq .ft	-	72,522 sq. ft
2-Bay Hangar	134,310 sq. ft	-	122,310 sq. ft
Contractor Logistics Support (CLS)		16,100 sq. ft	
Aircraft Access Apron	40,320 sq. ft	-	40,320 sq. ft
Replacement of Existing Displaced Facilities	13,564 sq. ft	-	13,564 sq. ft
<b>Total Area Affected</b>	<b>298,878 sq. ft</b>	<b>16,100 sq. ft</b>	<b>286,878 sq. ft</b>

**Table 8-3 Baseline (2011) and Projected Aircraft Loading at MCBH Kaneohe Bay**

<b>Aircraft Type</b>	<b>Baseline (2011)</b>	<b>Alternatives 1, 5, and 6</b>	<b>Alternative 2</b>	<b>Alternatives 3 and 4</b>
C-20G	3	3	3	3
CH-53D	30	0	0	0
SH-60B	10	0	0	0
MH-60R	0	9	9	9
P-3C	24	0	0	0
P-3C Update <sup>1</sup>	3	3	3	3
MV-22B	0	36	36	36
P-8A MMA	0	18	0	12
<b>Total</b>	<b>70</b>	<b>69</b>	<b>51</b>	<b>63</b>
<b>Net Change</b>	<b>–</b>	<b>(-1)</b>	<b>(-19)</b>	<b>(-7)</b>

Note:

<sup>1</sup> The P-3C Update aircraft are not part of the P-8A MMA replacement action.

## 8.1 Airfield Operations

The projected number of annual aircraft operations for Alternatives 1 through 6 was calculated using the *Patrol Reconnaissance Group Projected P-8 Syllabus Flight Operations*. On the basis of this analysis, the number of annual operations at MCBH Kaneohe Bay is projected to decrease under each alternative (see Table 8-4).

Under Alternatives 1, 5, and 6 the three existing P-3C fleet squadrons would be transitioned to three P-8A MMA fleet squadrons. The projected number of annual aircraft operations under Alternatives 1, 5, and 6 would decrease by 5,520 operations, a decrease of 10% below the baseline year number of operations.

Alternative 2 would reduce the three P-3C fleet squadrons to one permanent squadron detachment of P-8A MMA. Annual aircraft operations projected for Alternative 2 would decrease

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**Table 8-4 Projected Basic Operations at MCBH Kaneohe Bay**

Baseline Total		Alternatives 1, 5, and 6			Alternative 2			Alternatives 3 and 4		
		Day (7:00 a.m. to 10:00 p.m.)	Night (10:00 p.m. to 7:00 a.m.)	Total	Day (7:00 a.m. to 10:00 p.m.)	Night (10:00 p.m. to 7:00 a.m.)	Total	Day (7:00 a.m. to 10:00 p.m.)	Night (10:00 p.m. to 7:00 a.m.)	Total
CH-53D										
Departure	1,455	0	0	0	0	0	0	0	0	0
Visual Arrival	1,407	0	0	0	0	0	0	0	0	0
TACAN Arrival	48	0	0	0	0	0	0	0	0	0
Touch-and-Go	8,996	0	0	0	0	0	0	0	0	0
GCA Pattern	364	0	0	0	0	0	0	0	0	0
Total	12,270	0	0	0	0	0	0	0	0	0
MV-22										
Departure	0	1,360	95	1,455	1,360	95	1,455	1,360	95	1,455
Visual Arrival	0	1,312	95	1,407	1,312	95	1,407	1,312	95	1,407
TACAN Arrival	0	48	0	48	48	0	48	48	0	48
Touch-and-Go	0	8,698	298	8,996	8,698	298	8,996	8,698	298	8,996
GCA Pattern	0	347	17	364	347	17	364	347	17	364
Total	0	11,765	505	12,270	11,765	505	12,270	11,765	505	12,270
H-60										
Departure	1,063	1,013	50	1,063	1,013	50	1,063	1,013	50	1,063
Visual Arrival	1,037	987	50	1,037	987	50	1,037	987	50	1,037
TACAN Arrival	26	26	0	26	26	0	26	26	0	26
Touch-and-Go	7,420	7,187	233	7,420	7,187	233	7,420	7,187	233	7,420
GCA Pattern	242	237	5	242	237	5	242	237	5	242
Total	9,788	9,450	338	9,788	9,450	338	9,788	9,450	338	9,788
P-3C										
Departure	1,599	0	0	0	0	0	0	0	0	0
Visual Arrival	1,599	0	0	0	0	0	0	0	0	0
TACAN Arrival	0	0	0	0	0	0	0	0	0	0
Touch-and-Go	19,040	0	0	0	0	0	0	0	0	0
GCA Pattern	3,768	0	0	0	0	0	0	0	0	0
Total	26,006	0	0	0	0	0	0	0	0	0

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**Table 8-4 Projected Basic Operations at MCBH Kaneohe Bay (continued)**

		Alternatives 1, 5, and 6			Alternative 2			Alternatives 3 and 4		
		Day (7:00 a.m. to 10:00 p.m.)	Night (10:00 p.m. to 7:00 a.m.)	Total	Day (7:00 a.m. to 10:00 p.m.)	Night (10:00 p.m. to 7:00 a.m.)	Total	Day (7:00 a.m. to 10:00 p.m.)	Night (10:00 p.m. to 7:00 a.m.)	Total
Baseline Total										
P-3C Update <sup>1</sup>										
Departure	133	123	10	133	123	10	133	123	10	133
Visual Arrival	133	123	10	133	123	10	133	123	10	133
TACAN Arrival	0	0	0	0	0	0	0	0	0	0
Touch-and-Go	1,952	1,952	0	1,952	1,952	0	1,952	1,952	0	1,952
GCA Pattern	390	390	0	390	390	0	390	390	0	390
Total	2,608	2,588	20	2,608	2,588	20	2,608	2,588	20	2,608
C-20G (G4)										
Departure	383	366	17	383	366	17	383	366	17	383
Visual Arrival	273	260	13	273	260	13	273	260	13	273
TACAN Arrival	110	107	3	110	107	3	110	107	3	110
Touch-and-Go	196	196	0	196	196	0	196	196	0	196
GCA Pattern	152	146	6	152	146	6	152	146	6	152
Total	1,114	1,075	39	1,114	1,075	39	1,114	1,075	39	1,114
Transient Aircraft										
Departure	1,506	1,463	43	1,506	1,463	43	1,506	1,463	43	1,506
Visual Arrival	1,097	1,061	36	1,097	1,061	36	1,097	1,061	36	1,097
TACAN Arrival	409	403	6	409	403	6	409	403	6	409
Touch-and-Go	4,336	4,336	0	4,336	4,336	0	4,336	4,336	0	4,336
GCA Pattern	289	277	12	289	277	12	289	277	12	289
Total	7,637	7,540	97	7,637	7,540	97	7,637	7,540	97	7,637
P-8A MMA										
Departure	0	1,300	39	1,339	190	25	215	1,040	31	1,071
Visual Arrival	0	1,276	38	1,314	187	25	212	1,021	30	1051
TACAN Arrival	0	24	1	25	3	0	3	19	1	20
Touch-and-Go	0	14,840	0	14,840	988	0	988	11,872	0	11,872
GCA Pattern	0	2,968	0	2,968	328	0	328	2,374	0	2,374
Total	0	20,408	78	20,486	1,696	50	1,746	16,326	62	16,326

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**Table 8-4 Projected Basic Operations at MCBH Kaneohe Bay (continued)**

	Baseline Total	Alternatives 1, 5, and 6			Alternative 2			Alternatives 3 and 4		
		Day (7:00 a.m. to 10:00 p.m.)	Night (10:00 p.m. to 7:00 a.m.)	Total	Day (7:00 a.m. to 10:00 p.m.)	Night (10:00 p.m. to 7:00 a.m.)	Total	Day (7:00 a.m. to 10:00 p.m.)	Night (10:00 p.m. to 7:00 a.m.)	Total
<b>Airfield Total</b>	<b>59,423</b>			<b>53,903</b>			<b>35,163</b>	<b>46,156</b>	<b>1,041</b>	<b>49,743</b>
<b>Net Change</b>	<b>---</b>			<b>(-)5,520</b>			<b>(-)24,260</b>			<b>(-)9,680</b>
<b>Percent Net Change</b>				<b>(-)10%</b>			<b>(-)40%</b>			<b>(-)16%</b>

Source: Wyle Laboratories, Inc. July 2008.

Notes:

Baseline P-3C air operation numbers are under review.

<sup>1</sup> The P-3C Update aircraft are not part of the P-8A MMA replacement action.

Key:

GCA = Ground control approach.

TACAN = Tactical Air Navigation.



operations by 24,260, representing a 40% reduction. This alternative represents the greatest reduction in flight operations.

Alternatives 3 and 4 transition the three existing P-3C fleet squadrons to two P-8A MMA fleet squadrons at MCBH Kaneohe Bay. Under Alternatives 3 and 4 the projected annual flight operations would decrease by 9,680 operations, which would be 16% below the existing level of annual operations.

Under the No Action Alternative, there would be no change in the number of annual air operations (59,423).

The P-8A MMA squadrons would follow the same training and deployment cycle as that of the P-3C squadrons, and no change is proposed to existing types of flight operations or flight tracks. MCBH Kaneohe Bay meets all the operational requirements of routine operating conditions to support the airfield operations of the P-8A MMA squadrons and a fleet replacement squadron (FRS).

## **8.2 Noise**

The noise analysis in this section is presented in two parts. First, a detailed discussion on the day-night average sound level (DNL) changes due to the replacement of the P-3C with the P-8A MMA is presented. The 24-hour DNL is a reliable measure of community sensitivity to aircraft noise and is the Federal Aviation Administration's (FAA) standard noise metric used in the United States to measure the effects of aircraft noise for both commercial airports and military installations. DNL takes into account both the noise levels of all individual events that occur during a 24-hour period and the number of times those events occur. The 65 decibel (dB) DNL contour is the lowest noise contour for which Navy guidance on incompatible land uses is provided. DNL noise contours have historically been used as the noise metric for MCBH Kaneohe Bay.

Secondly, in response to comments received during the draft EIS public comment period, the discussion presents an analysis of the sound exposure levels (SEL) for single-event aircraft overflights. The SEL value represents the sound energy exposure at a specific location resulting from a specific aircraft operation. It is provided in this noise analysis to allow the reader to compare the relative difference in sound emitted by two different aircraft. A full discussion on noise modeling and the background data for this analysis are included in Appendix F.

### 8.2.1 Day-Night Average Sound Levels (DNL) for Kaneohe Bay

The projected noise contours for the greater-than-65 dB DNL contours at MCBH Kaneohe Bay increase compared with the baseline contours under Alternatives 1, 3, 4, 5, and 6, and decrease under Alternative 2. However, in neither the baseline nor any projected alternative noise contour are residential populations exposed to noise levels of 65dB DNL or greater. This is primarily due to the following factors:

- Although noise levels for the P-3C and P-8A MMA flight profiles are similar (Table 8-5) for takeoffs and landings, noise levels for the P-8A MMA flight profiles are noticeably louder than the P-3C for touch-and-go operations (Wyle Laboratories, Inc. July 2008).
- The projected 2019 noise zones for MCBH Kaneohe Bay primarily extend over the installation and water surrounding the installation.

Therefore, the noise impacts for all of the alternatives except Alternative 2 at MCBH Kaneohe Bay would increase when compared with baseline conditions.

**Table 8-5 Comparative Single-Event Sound Levels for the P-3C, P-8A MMA, and C-17**

Condition	SEL for Flyover at 1,000 feet AGL			
	P-3C	P-8A	C-17	C-5
Takeoff	94	95	99	113
Approach	85	87	93	107
Touch and Go – Downwind	86	94	94	110

Source: Wyle Laboratories, Inc. July 2008.

Key:

AGL = above ground level.

Projected noise contours for MCBH Kaneohe Bay under each siting alternative are shown in Figures 8-1 through 8-3. The off-station area and estimated population within projected noise zones at MCBH Kaneohe Bay under each of the replacement alternatives is shown in Table 8-6.

**Table 8-6 Off-Station Area (Acres) and Estimated Population within Projected Noise Zones at MCBH Kaneohe Bay under Alternatives 1 through 6**

	Existing (2011)		Alternatives 1, 5, and 6 (2019)		Alternative 2 (2019)		Alternatives 3 and 4 (2019)	
	Area	Pop.	Area	Pop.	Area	Pop.	Area	Pop.
65 to 70 dB	11	0	11	0	10	0	11	0
70 to 75 dB	10	0	11	0	11	0	10	0
75 dB or greater	0	0	0	0	0	0	0	0
<b>Total</b>	<b>21</b>	<b>0</b>	<b>22</b>	<b>0</b>	<b>21</b>	<b>0</b>	<b>20</b>	<b>0</b>
<b>Net Change</b>			<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>
<b>Percent Net Change</b>			<b>5%</b>	<b>0%</b>	<b>0%</b>	<b>0%</b>	<b>(5)%</b>	<b>0%</b>

Source: Wyle Laboratories, Inc. July 2008.

Key:

dB = Decibels.

The projected 2019 65 dB DNL or greater noise contours for MCBH Kaneohe Bay primarily extend over the installation and water surrounding the installation. Coconut Island and a few other small uninhabited islands are the only land areas within the noise zones for MCBH Kaneohe Bay. Coconut Island serves as a marine research center for the University of Hawaii. While there may be a small number of staff and students present at the facility at any one time, they would be considered a temporary population and are not included in the analysis for population within the projected noise contours at MCBH Kaneohe Bay. Since the projected noise contours are contained over water, military lands, or Coconut Island, no civilian residences would be located within the 65 dB DNL noise contours.

Alternatives 1, 3, 4, 5, and 6 would base from two to three fleet squadrons at MCBH Kaneohe Bay, for a total of 12 to 18 P-8A MMA. These alternatives would increase the off-station land area within the greater-than-65 dB DNL noise zone by approximately 1 acre. Alternative 2 would result in a permanent squadron detachment at the base, consisting of two planes. Under this alternative, the off-station land area within the greater-than-65 dB DNL noise zone would remain approximately the same and there would continue to be no off-base residents within this noise zone.

### **8.2.2 Sound Exposure Level (SEL) Analysis**

Although the DNL is the standard metric for expressing aircraft noise impacts, in response to comments received on the draft EIS, this document provides a discussion on single event noise level analysis. As outlined in Section 7.2, the SEL (as opposed to the DNL, which represents a 24-hour average noise metric) is a composite metric that represents both the intensity of a sound and its duration. The SEL shows the effect of an individual noise event such as an aircraft overflight. Table 8-5 shows the comparative difference in SEL noise values for the P-3C, P-8A MMA, C-17, and C-5. The C-17 and C-5 are included because of their respective influence in the noise environment at MCBH Kaneohe Bay.

The P-3C, as a turboprop, and the P-8A MMA, as a jet aircraft, generally have different noise characteristics. For example, the P-8A MMA exhibits more noise in some higher frequency bands during approach (2,500 hertz [Hz] to 5,000 Hz) than the P-3C and, as a result, while the overall sound energy of the two aircraft is similar, people on the ground will likely detect the “whine” from the P-8A MMA turbofan engines during approach operations. However,

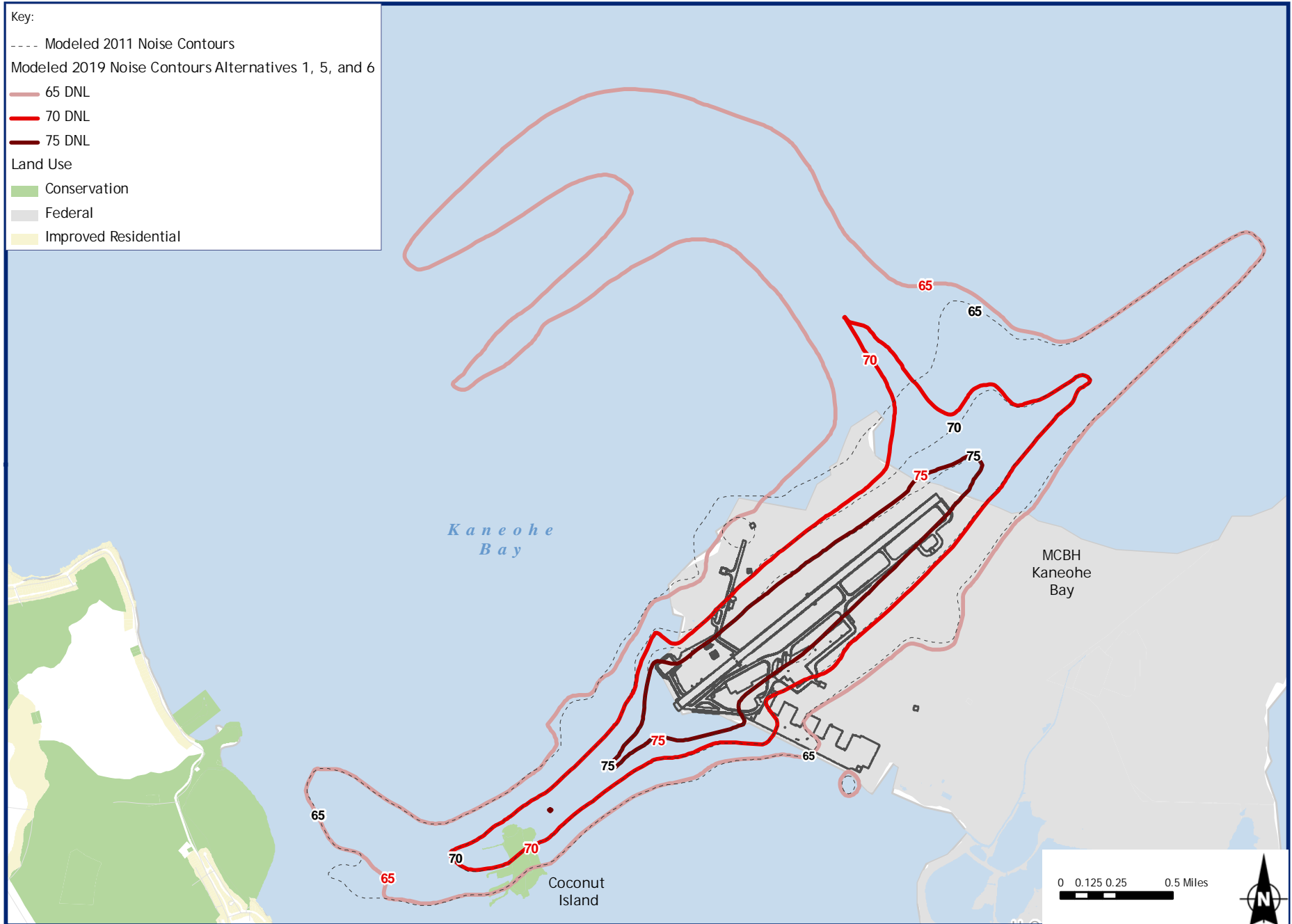


Figure 8-1  
Comparison of Modeled 2011 DNL Noise Contours  
and 2019 DNL Noise Contours Projected Under Alternatives 1, 5, and 6  
MCBH Kaneohe Bay, Hawaii

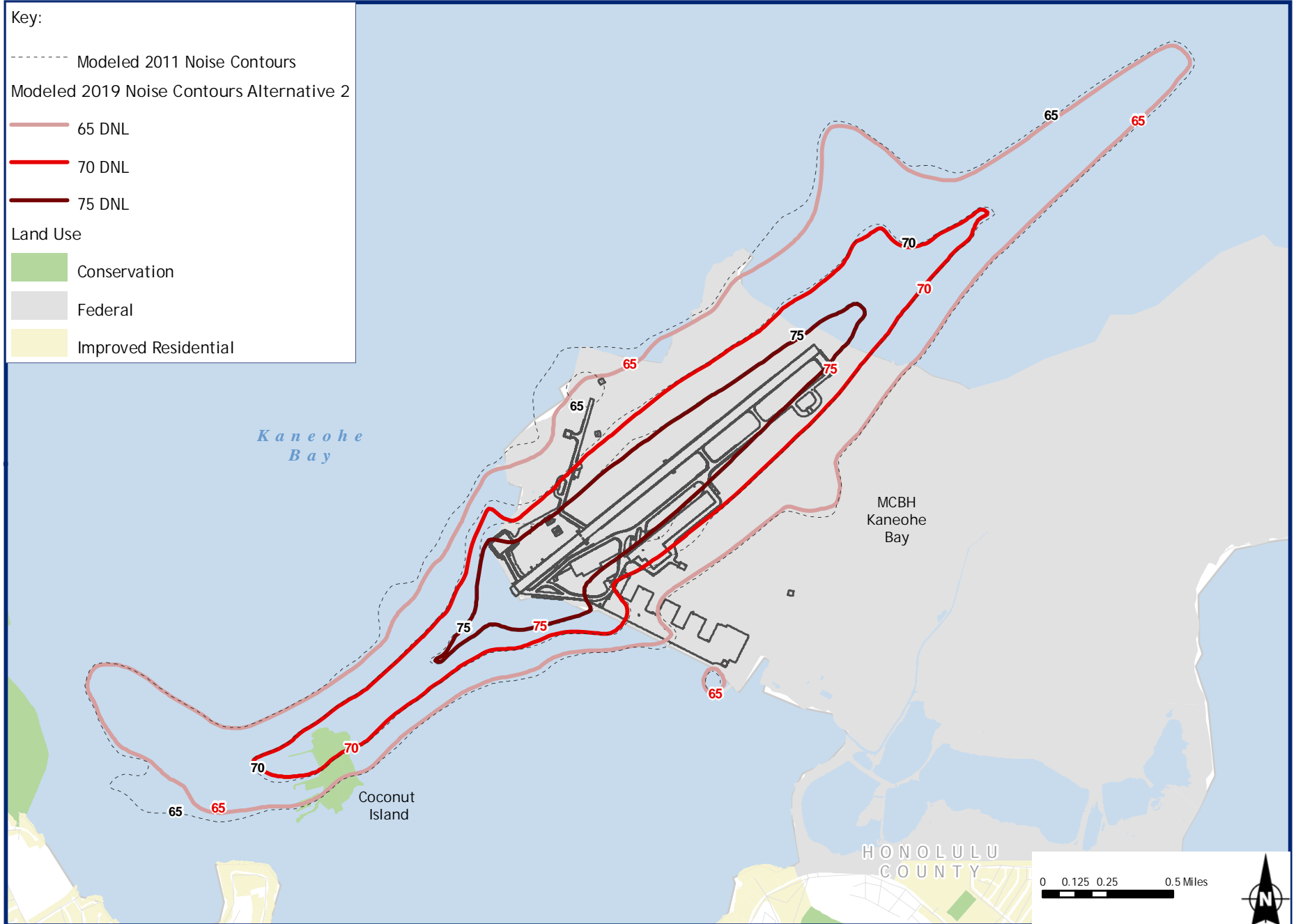


Figure 8-2  
 Comparison of Modeled 2011 DNL Noise Contours  
 and 2019 DNL Noise Contours Projected Under Alternative 2  
 MCBH Kaneohe Bay, Hawaii

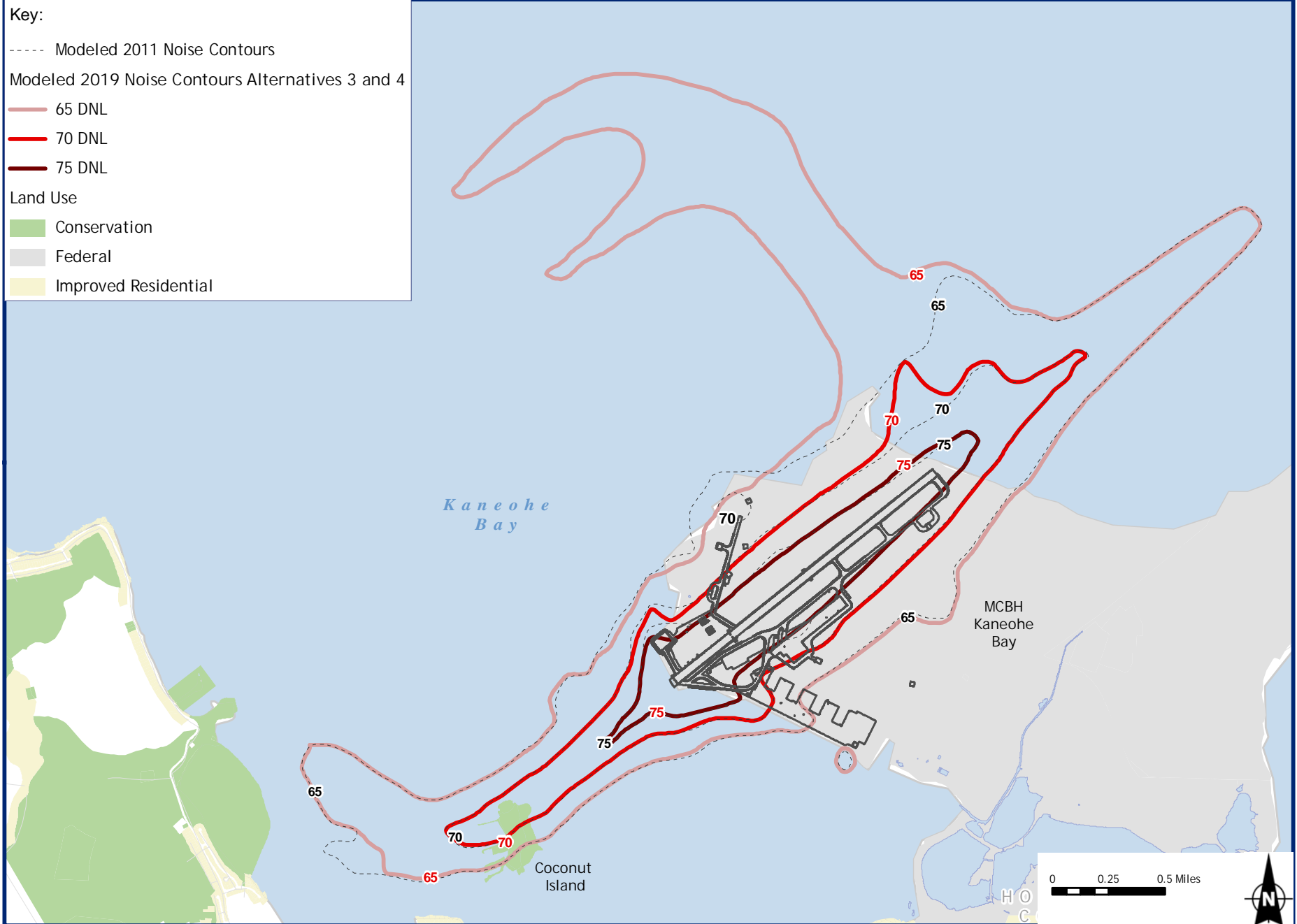


Figure 8-3  
 Comparison of Modeled 2011 DNL Noise Contours  
 and 2019 DNL Noise Contours Projected Under Alternatives 3 and 4  
 MCBH Kaneohe Bay, Hawaii

the actual increase in total sound energy at a distance of 1,000 feet during approach operations for a P-8A MMA would range only from 1 dB to 2 dB. A larger difference in SEL noise values can be found when comparing touch-and-go operations. In this case, the P-8A MMA can be up to 8 dB louder for touch-and-go operations when compared with the P-3C. The C-17, when compared with the P-8A MMA for approach, departure, and touch-and-go operations, is approximately 4, 6, and 10 dB louder, respectively. The C-5, when compared with the P-8A MMA for approach, departure, and touch-and-go operations, is approximately 18, 20, and 16 dB louder, respectively, and therefore dominates the single-event noise environment at MCBH Kaneohe Bay. However, the 1,000-foot overflight data indicates that the population at or in the immediate vicinity of MCBH Kaneohe Bay flight operations would be exposed to higher single-event noise levels during P-8A MMA operations when compared with current P-3C aircraft (Wyle Laboratories, Inc. July 2008).

### Points of Interest Analysis

Noise exposures at selected locations in the vicinity of MCBH Kaneohe Bay were analyzed for single-event noise levels. The Navy identified four locations within the surrounding communities and near MCBH Kaneohe Bay as points of interest to the community. The locations were selected based on comments received during the public comment period and were chosen to represent public areas in the vicinity of MCBH Kaneohe Bay. (Note that the modeled sound is representative only for each individual location and does not provide a representative measure of the sound heard during aircraft overflights in other areas.) These locations are listed in Table 8-7 and are shown on Figure 8-4.

**Table 8-7 Highest SEL Value (dB) for Modeled Aircraft Operations at Points of Interest for all Alternatives**

Point of Interest	C-17	C-5	P-3C	P-8A MMA
University of Hawaii Marine Laboratory at Coconut Island	91.7	107.8	84.7	87.9
King Intermediate School	N/A	97.1	74	81
Heeia State Park	87.6	111.7	87.5	90.4
Kalaheo High School	67.4	N/A	58.2	65.3

Key:

N/A = Data not available.

Table 8-7 shows the loudest operation for the C-17, C-5, P-3C, and P-8A at four different locations in the vicinity of MCBH Kaneohe Bay. The noise exposure for each aircraft event at

each location is represented by the SEL. For example, Table 8-7 shows that the loudest operation at Coconut Island would be a C-5 at 107.8 dB SEL, followed by a C-17 at 91.7 dB SEL, a P-8A MMA at 87.9 dB, and a P-3C at 84.7 dB SEL. The other points of interest show similar increases in modeled SEL noise values. As discussed in Section 7.2, an increase in the SEL of about 5 dB can be perceived as a quite noticeable increase in single-event noise levels. A result of the proposed P-8A MMA air operations would be an increase of 3 to 7 dB SEL at the points of interest when compared with similar P-3C operations.

The noise exposure for the loudest SEL flight operation for each aircraft event at each location is noted in Table 8-7. Table 8-7 shows that the top contributor at the University of Hawaii Marine Laboratory at Coconut Island, the C-5, has a modeled SEL of 107.8 dBA for touch-and-go operations; the C-17 has a modeled SEL value of 91.7 dBA for touch-and-go operations, and the P-3C has a modeled SEL value of 84.7 dBA.

In comparison, the loudest P-3C operation at any of the point of interest locations is a touch-and-go pattern with a SEL value of 87.5 dBA, while the loudest P-8A MMA touch-and-go operation had a SEL value of 90.4 dBA (see Appendix F for a detailed description of this analysis).

A result of the proposed P-8A MMA operations would be an increase in single-event noise exposure to the population living in the areas near the point of interests. Increases in SEL noise values for the P-8A MMA operations range from approximately 3 dB SEL at the University of Hawaii Marine Laboratory (Coconut Island) and Heeia State Park to approximately 7 dB SEL for both the King Intermediate School and the Kalaheo High School location.

## **8.3 Land Use**

### **8.3.1 MCBH Kaneohe Bay Land Use**

The primary construction projects associated with basing two or three fleet squadrons at MCBH Kaneohe Bay include a new aircraft hangar, a parking area for privately owned vehicles (POVs), and various operational support facilities. Under Alternatives 1, 5, and 6, which would base three fleet squadrons at MCBH, a new aircraft parking apron would need to be constructed. Facilities needed to support the permanent squadron detachment at MCBH Kaneohe Bay under Alternative 2 would be limited to a POV parking area and two operational support buildings would



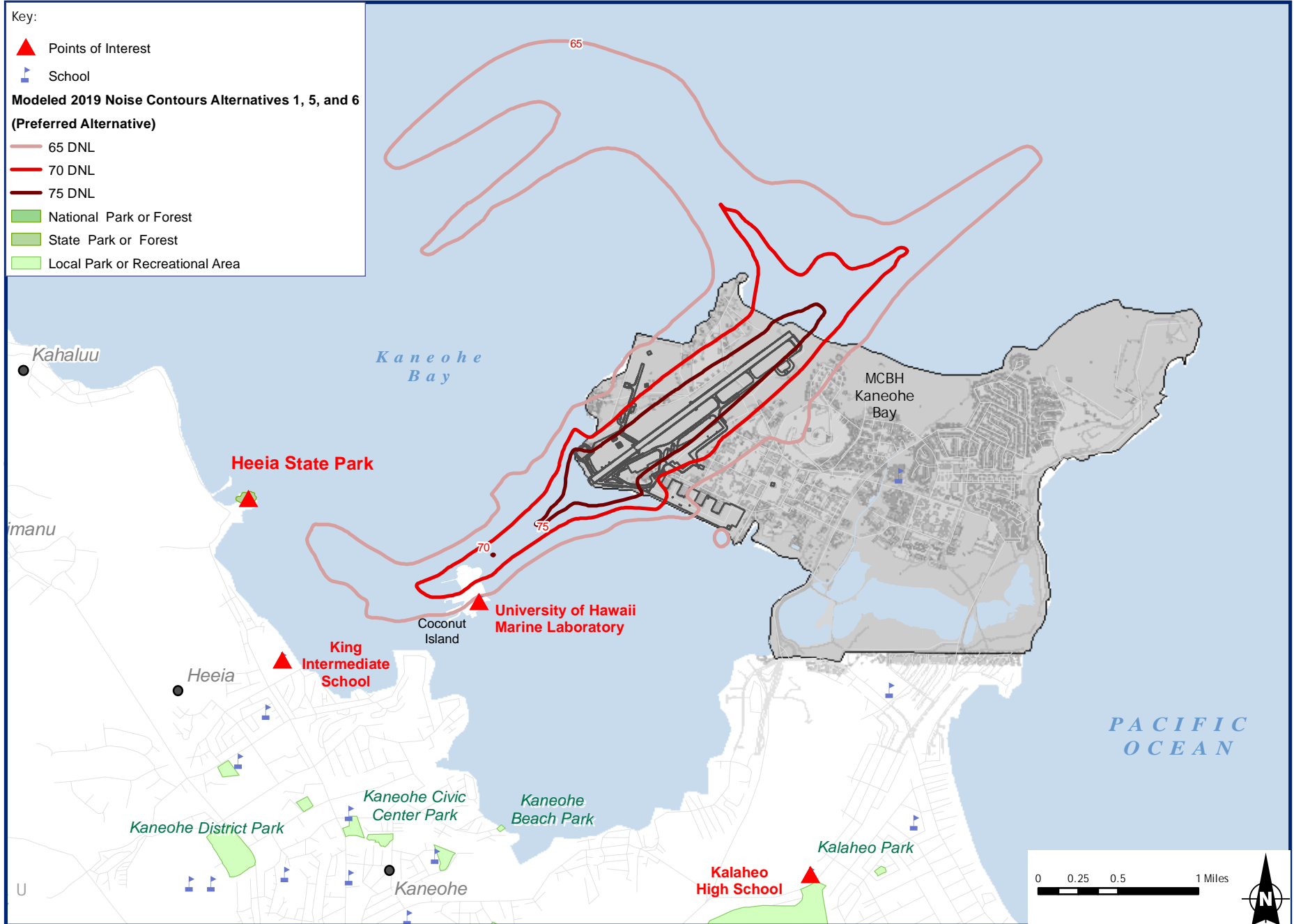


Figure 8-4  
 Points of Interest in the Vicinity of MCBH Kaneohe Bay, Hawaii

not require the construction of any new support infrastructure. The area of new construction required to support the P-8A MMA squadrons under each basing alternative is provided in Table 8-2. The location of the proposed construction projects is shown on Figure 2-10 in Section 2, Proposed Action and Alternatives.

All new construction would be located on the south side of the airfield either on or adjacent to areas currently developed to support airfield operations. Land use in this portion of the base has been designated as an “Air and Ground Operations Training Area.” Construction of new facilities in this area would be consistent with current land use designations and would maximize use of vacant land close to the flight line.

### **8.3.2 Regional Land Use**

Proposed new construction and personnel transitions under each replacement alternative at MCBH Kaneohe Bay would have minor impacts on regional land use. All project-related construction would occur within the existing boundaries of MCBH Kaneohe Bay and would not conflict with surrounding land uses off-base. The proposed action would not result in any indirect growth-induced development; under all replacement alternatives, the number of personnel stationed or employed at MCBH Kaneohe Bay would decrease. The largest decrease in personnel (Alternative 2) would represent only 0.5% of the total population of 952,650 and therefore would not be considered significant enough to result in any residential or business foreclosures or abandonment of residential, commercial, or office establishments that would affect existing land use.

The projected noise zones under Alternatives 1, 3, 4, 5, and 6 would extend over land not previously within the 2011 baseline contours for MCBH Kaneohe Bay. A land-use compatibility assessment of the replacement alternatives is included in Section 8.3.4.

Under the No Action Alternative no new construction or personnel transition would occur; therefore, regional land use would not be affected.

### **8.3.3 Land-Use Controls**

The proposed action has been evaluated relative to the following land-use controls:

- Navy and Marine Corps Air Installations Compatible Use Zones (AICUZ) Program;
- The 2006 MCBH Master Plan;
- The 2006 MCBH Integrated Natural Resources Management Plan (INRMP);

- MCBH Integrated Cultural Resource Management Plan (ICRMP);
- Koolaupoko Sustainable Communities Plan; and
- Hawaii Coastal Zone Management (CZM) Program.

### **AICUZ Program**

Under any of the proposed replacement alternatives at MCBH Kaneohe Bay, the Marine Corps may choose to recommend a new AICUZ study to identify areas where land use controls are needed to promote compatible development within the projected noise zones. However, the proposed action does not affect the goals of the program or land use recommendations for land that is considered compatible with aircraft operations and is consistent with community development plans.

**Noise.** Depending on the replacement alternative (see Section 8.2 above) the noise zones that would be relevant to the new AICUZ would be those within the projected noise contours shown in Figures 8-1 through 8-3.

**APZs.** The number and type of airfield operations and flight tracks are used as the basis for identifying accident potential zones (APZs) around an air station. While the projected number of airfield operations would be reduced at MCBH Kaneohe Bay, flight tracks would remain the same when the P-8A MMA replaces the P-3C. As a result, baseline APZs at MCBH, as shown in the 2003 AICUZ, would not change under any proposed replacement alternative.

The No Action Alternative would have no effect on the current AICUZ Program because current aviation activities at MCBH Kaneohe Bay would continue unchanged.

### **MCBH Master Plan**

Implementation of any of the replacement alternatives at MCBH Kaneohe Bay would be consistent with the goals and objectives of the 2006 Master Plan, which divides the base into six zones according to the primary activity taking place in that zone. The proposed location of facilities to support the P-8A MMA would be consistent with the plan because the area where the proposed construction would take place is in the Air and Ground Operations and Training Zone. Part of the Master Plan regarding future land use recommends existing uses be retained at their current location by demolishing and replacing facilities on or near their current site. The proposed action would be consistent with this recommendation because it includes renovating and

expanding current facilities, demolishing existing facilities, and constructing new facilities on those same sites.

Implementation of the No Action Alternative would not be compatible with the goal of the MCBH Master Plan to support the long-range vision for the Marine Corps' presence in Hawaii.

### **MCBH Integrated Natural Resources Management Plan (INRMP)**

The proposed action would be consistent with management objectives expressed in the INRMP (Marine Corps Base Hawaii 2006), which focuses on protecting and preserving the mission of MCBH Kaneohe Bay and all on-station natural resources. Implementation of any one of the replacement alternatives would be consistent with the station's management practices being implemented under the INRMP. The proposed construction sites are either currently developed or maintained turf, so no natural areas at the installation would be affected.

Under the No Action Alternative natural resources at MCBH Kaneohe Bay would not be affected.

### **MCBH Kaneohe Bay Integrated Cultural Resources Management Plan (ICRMP)**

The proposed action would be consistent with management actions expressed in the ICRMP (Marine Corps Base Hawaii 2006), which focus on protecting and preserving all on-station cultural resources while reducing conflicts between cultural resources management and the mission of MCBH Kaneohe Bay. If cultural resources are identified within the potential areas of impact, the Marine Corps would continue to work with various stakeholders, including the Hawaii SHPO, to develop appropriate mitigation measures to avoid impacts on cultural resources. Consequently, the proposed action would be consistent with the management actions of the base's ICRMP to manage and protect cultural resources at the base from potential adverse effects.

Under the No Action Alternative cultural resources at MCBH Kaneohe Bay would not be affected.

### **Koolaupoko Sustainable Communities Plan**

The proposed action would be consistent with the principles for future land use in the Koolaupoko Planning Region. Basing the P-8A MMA at Kaneohe Bay would modernize the military's presence in Koolaupoko and be consistent with the region's long-term commitment to the military.

Implementation of the No Action Alternative would not be consistent with the region's long-term commitment to the military.

### **Federal Consistency with Hawaii Coastal Zone Management Program**

Based on a comprehensive coastal consistency program and policy analysis, the Navy has determined that the proposed action would be consistent to the maximum extent practicable with applicable enforceable coastal zone policies of the federally approved Hawaii CZM Program. The Hawaii CZM Program concurred with the Navy's finding. Copies of both the Navy's Coastal Consistency Determination (CCD) letter, dated July 14, 2008, as well as the Hawaii CZM Program concurrence letter, dated September 5, 2008, are included in Appendix J.

#### **8.3.4 Land-Use Compatibility Assessment**

Aircraft operations associated with replacement of P-3C aircraft with the P-8A MMA under Alternatives 1, 3, 4, 5, and 6 would increase the area within the greater-than-65 dB DNL noise zones of MCBH Kaneohe Bay (see Figures 8-1 and 8-3); the area within the greater-than-65 dB DNL noise zones would decrease slightly under Alternative 2. Tables 8-8, 8-9, and 8-10 show the change in land uses around MCBH Kaneohe Bay between the modeled baseline and projected noise contours under each of the replacement alternatives.

**Table 8-8 Net Change in Area within the Projected Greater-than-65 dB DNL Noise Zones around MCBH Kaneohe Bay under Alternatives 1, 5, and 6**

<b>Land Use</b>	<b>Total Area Baseline (acres)</b>	<b>Total Area Alternatives 1, 5, and 6 (acres)</b>	<b>Net Change (acres)</b>	<b>% Net Change</b>
Military	735	755	20	3
Water	1,066	1,982	916	86
Conservation	21	21	0	0
<b>Total</b>	<b>1,822</b>	<b>2,758</b>	<b>936</b>	<b>51</b>

**Table 8-9 Net Change in Area within the Projected Greater-than-65 dB DNL Noise Zones around MCBH Kaneohe Bay under Alternative 2**

Land Use	Total Area Baseline (acres)	Total Area Alternative 2 (acres)	Net Change (acres)	% Net Change
Military	735	709	(-)26	(-)4
Water	1,066	978	(-)88	(-)8
Conservation	21	20	(-)1	(-)5
<b>Total</b>	<b>1,822</b>	<b>1,707</b>	<b>(-)115</b>	<b>(-)6</b>

**Table 8-10 Net Change in Area within Projected Greater-than-65 dB DNL Noise Zones around MCBH Kaneohe Bay under Alternatives 3 and 4**

Land Use	Total Area Baseline (acres)	Total Area Alternatives 3 and 4(acres)	Net Change (acres)	% Net Change
Military	735	748	13	2
Water	1,066	1,686	620	58
Conservation	21	21	0	0
<b>Total</b>	<b>1,822</b>	<b>2,455</b>	<b>633</b>	<b>35</b>

In the vicinity of MCBH Kaneohe Bay, the effect of replacing the P-3C with the P-8A MMA would result in an 51% overall increase in the amount of land and water acreage within the projected greater-than-65 dB DNL noise zones under Alternatives 1, 5, and 6 and a 35% increase under Alternatives 3 and 4. However, all of the additional area within the projected noise contours under these alternatives cover land within the base boundary or over water. Only 2 acres of additional conservation land (i.e., Coconut Island) would be included in the greater-than-65 dB DNL noise contour. No residential land would be added under any of the replacement alternatives.

The No Action Alternative, represented as the baseline conditions in Tables 8-8, 8-9, and 8-10, would have no effect on land-use compatibility because current aviation activities at MCBH Kaneohe Bay would continue unchanged.

## **8.4 Air Quality**

Air quality impacts associated with the proposed action are related to emissions from short-term construction activities and long-term aircraft operations and personnel commuting changes.

Construction may affect air quality primarily as a result of construction equipment emissions, paving and painting emissions, and fugitive dust from grading and earthmoving. These emissions are calculated separately from operational emissions because they are temporary in nature and would occur prior to full implementation of the chosen action. New operation emissions would result from the flight operations of the P-8A MMA and commuting activities of new station personnel. Because these new emissions would be offset by decreased emissions as a result of the discontinued use of the P-3C aircraft, the *total changes* in emissions have been evaluated. Other site emissions, such as those from stationary sources, other aircraft, ground support equipment (GSE), and other sources, are assumed to remain constant under this action. Cumulative impacts are discussed in Section 11.

#### **8.4.1 Construction Emissions**

Table 8-11 provides information regarding estimated new construction at MCBH Kaneohe Bay under all alternatives. Construction emissions have been estimated using guidelines published by the El Dorado County, California Air Pollution Control District (APCD) California Environmental Quality Act (CEQA) Guide (February 2002) and U.S. Environmental Protection Agency (EPA) AP-42 (U.S. Environmental Protection Agency 1995), based on estimates of equipment to be used, on average, throughout the year, assuming a one-year construction period and 250 workdays per year. A workday is assumed to be eight hours long. Particulate emissions from site preparation and demolition activities are also considered. Total projected annual construction emissions in tons per year (tpy) at MCBH Kaneohe Bay under each alternative are listed in Table 8-11. Construction equipment, activities, emission factors, and calculations are detailed in Appendix H.

**Table 8-11 Construction Emissions MCBH Kaneohe Bay, All Alternatives**

Activity	Emissions (tpy)			
	NOx	VOC	CO	PM <sub>10</sub>
<b>Alternatives 1, 5, and 6</b>				
Construction equipment	38.88	4.10	25.21	2.05
VOCs from paving and painting		6.68		
PM <sub>10</sub> from site preparation and demolition				1.62
<b>Total</b>	<b>38.88</b>	<b>10.77</b>	<b>25.21</b>	<b>3.68</b>

**Table 8-11 Construction Emissions MCBH Kaneohe Bay, All Alternatives (continued)**

Activity	Emissions (tpy)			
	NOx	VOC	CO	PM <sub>10</sub>
<b>Alternative 2</b>				
Construction equipment	9.22	0.97	5.99	0.49
VOCs from paving and painting		0.43		
PM <sub>10</sub> from site preparation				0.75
<b>Total</b>	<b>9.22</b>	<b>1.40</b>	<b>5.99</b>	<b>1.24</b>
<b>Alternative 3 and 4</b>				
Construction equipment	38.88	4.10	25.21	2.05
VOCs from paving and painting		6.36		
PM <sub>10</sub> from site preparation and demolition				1.62
<b>Total</b>	<b>38.88</b>	<b>10.45</b>	<b>25.21</b>	<b>3.68</b>

Key:

CO = Carbon monoxide.

NOx = Nitrogen oxides.

PM<sub>10</sub> = Particulate matter less than 10 microns in diameter.

tpy = Tons per year.

VOC = Volatile organic compound.

#### **8.4.2 Mobile Source Emissions**

Mobile source emissions considered in this analysis include P-8A MMA flight and maintenance operations and POV operations by new station personnel. Aircraft operation emission totals and the change in emission totals for aircraft and POV operations that would result from this action are listed in Table 8-12. Emission factors and calculations are detailed in Appendix H.

Emissions of P-8A MMA flight operations and maintenance operations are based upon emission indexes developed by the International Civil Aviation Organization (ICAO) for the CFM56-7B26 engine, which would be used in the P-8A MMA aircraft (International Civil Aviation Organization July 2007). Time-in-mode assumptions for landing-takeoff cycles (LTOs) are from the FAA Emissions and Dispersion Modeling System (EDMS) (June 29, 2007), which provides default time-in-mode values for the Boeing 737-800 series aircraft. These references were used to provide emission data because P-8A MMA data from the Aircraft Environmental Support Office (AESO) are not available at this time. Time-in-mode assumptions for touch-and-go and ground control approach (GCA) box operations are adapted from P-3C time-in-mode assumptions from the AESO (2000). Emissions from POVs were estimated based on California Air Resources Board's Emission Factors Model (EMFAC) 2007—which provides conservative



emission values for vehicle emissions (California Air Resources Board March 27, 2007)—and on changes in personnel estimates and are summarized in Table 8-12.

**Table 8-12 P-8A MMA Emissions – MCBH Kaneohe Bay, All Alternatives**

Flight Operation	No. of Aircraft <sup>1</sup>	No. of Operations <sup>1</sup>	Baseline Emissions (tpy) <sup>2</sup>				
			CO	NO <sub>x</sub>	HC	SO <sub>2</sub>	PM <sub>10</sub>
<b>Alternatives 1, 5, and 6</b>	<b>18</b>						
Straight-In Arrival LTOs		1,339	11.3	20.1	1.2	1.8	0.6
Touch-and-Go		7,420	0.7	23.4	0.1	0.4	0.6
GCA Pattern		1,484	0.4	3.2	0.1	0.1	0.2
Maintenance Run-Ups			0.004	0.026	0.000	0.001	0.001
<b>Total P-8A MMA Flight Ops Emissions</b>			<b>12.5</b>	<b>46.7</b>	<b>1.4</b>	<b>2.4</b>	<b>1.3</b>
Baseline P-3C Emissions			50.0	57.8	31.1	3.0	26.9
Change in Aircraft Emissions			(-)37.6	(-)11.1	(-)29.7	(-)0.6	(-)25.5
Change in POV Emissions			(-)16.3	(-)1.6	(-)1.7	0.0	(-)0.2
<b>Total Change in Mobile Operations Emissions</b>			<b>(-)53.9</b>	<b>(-)12.7</b>	<b>(-)31.4</b>	<b>(-)0.6</b>	<b>(-)25.7</b>
<b>Alternative 2</b>	<b>2</b>						
Straight-In Arrival LTOs		215	1.8	3.2	0.2	0.3	0.1
Touch-and-Go		494	0.048	1.560	0.007	0.029	0.039
GCA Pattern		164	0.044	0.350	0.010	0.015	0.021
Maintenance Run-Ups			0.000	0.003	0.000	0.000	0.000
<b>Total P-8A MMA Flight Ops Emissions</b>			<b>1.9</b>	<b>5.1</b>	<b>0.2</b>	<b>0.3</b>	<b>0.2</b>
Baseline P-3C Emissions			50.0	57.8	31.1	3.0	26.9
Change in Aircraft Emissions			(-)48.1	(-)52.6	(-)30.9	(-)2.6	(-)26.7
Change in POV Emissions			(-)34.2	(-)3.4	(-)3.6	(-)0.1	(-)0.4
<b>Total Change in Mobile Operations Emissions</b>			<b>(-)82.3</b>	<b>(-)56.0</b>	<b>(-)34.5</b>	<b>(-)2.7</b>	<b>(-)27.1</b>
<b>Alternatives 3 and 4</b>	<b>12</b>						
Straight-In Arrival LTOs		1,071	9.1	16.0	0.9	1.5	0.5
Touch-and-Go		5,936	0.6	18.7	0.1	0.3	0.5
GCA Pattern		1,187	0.3	2.5	0.1	0.1	0.1
Maintenance Run Ups			0.003	0.017	0.000	0.001	0.000
<b>Total P-8A MMA Flight Ops Emissions</b>			<b>10.0</b>	<b>37.3</b>	<b>1.1</b>	<b>1.9</b>	<b>1.1</b>
Baseline P-3C Emissions			50.0	57.8	31.1	3.0	26.9
Change in Aircraft Emissions			(-)40.1	(-)20.4	(-)30.0	(-)1.0	(-)25.8
Change in POV Emissions			(-)22.2	(-)2.2	(-)2.3	0.0	(-)0.3
<b>Total Change in Mobile Operations Emissions</b>			<b>(-)62.3</b>	<b>(-)22.6</b>	<b>(-)32.3</b>	<b>(-)1.1</b>	<b>(-)26.1</b>

Notes:

<sup>1</sup> Operations information from Wyle Laboratories, Inc. July 2008.

<sup>2</sup> Emissions calculated using emission factors from the International Civil Aviation Organization (2002) and California Air Resources Board (2007) (see Appendix H).

Key:

LTO = Landing-takeoff cycle.

### 8.4.3 Air Quality Impacts

Because MCBH Kaneohe Bay is located in a region that is in attainment for all criteria emissions, the Conformity Rule does not apply to the implementation of the proposed action. Prevention of Significant Deterioration (PSD) standards establish 250 tpy thresholds for criteria

pollutants for major stationary emissions sources, and while mobile and temporary emissions are not subject to these standards, the standards provide an adequate threshold to evaluate the significance of an action. Temporary construction total annual emissions are below 250 tpy for all criteria pollutants and projected annual operating emissions decrease under all alternatives; therefore, there will be no impacts on air quality resulting from the proposed action. Under the No Action Alternative, operations of the P-3C and staff levels would remain the same as baseline conditions, resulting in no change in emission totals or air quality conditions.

## **8.5 Socioeconomics**

### **8.5.1 Population and Housing**

#### **8.5.1.1 Population: Alternatives 1 through 6**

Under any one of the proposed alternatives associated with this action, the number of personnel stationed or employed at MCBH Kaneohe Bay would decrease. Table 8-13 shows the projected personnel loading (i.e., the number of military, civilian, and contractor personnel) at MCBH Kaneohe Bay under each of the alternatives.

**Table 8-13 Projected Change in Regional Population Resulting from P-8A MMA Personnel Transition to MCBH Kaneohe Bay**

<b>MCBH Kaneohe Bay/Honolulu County</b>	<b>Alternatives 1, 5, and 6</b>	<b>Alternative 2</b>	<b>Alternatives 3 and 4</b>
Honolulu County 2010 Population	952,650	952,650	952,650
<b>MMA Personnel</b>			
Military	(-)877	(-)1,556	(-)1,086
Civilian and Contractor	140	(38)	84
<b>Total MMA Personnel</b>	<b>(-)737</b>	<b>(-)1,594</b>	<b>(-)1,002</b>
<b>Dependents</b>			
Military Dependents	(-)1,729	(-)3,155	(-)2,168
Civilian/Contractor Dependents	344	(-)93	199
<b>Total Dependents</b>	<b>(-)1,385</b>	<b>(-)3,248</b>	<b>(-)1,969</b>
<b>Total Population Gain/(Loss)</b>	<b>(-)2,122</b>	<b>(-)4,842</b>	<b>(-)2,971</b>
<b>Population Gain/(Loss) as a Percent of 2010 Honolulu County Population</b>	<b>(-)0.2%</b>	<b>(-)0.5%</b>	<b>(-)0.3%</b>

Overall, fewer military personnel per P-8A MMA squadron are required than per P-3C squadron because the number of crew members required per aircraft would be less and because contractor support personnel, rather than military personnel, would maintain and service the air-

craft. Contractor support personnel would provide basic maintenance, preventive maintenance, inspections, servicing/replacement of various aircraft components, and specialized repair of in-operative components. In addition, the population impacts are believed to be conservative in comparison with the estimated 2010 population numbers for the local municipality. Personnel and squadron transition would actually occur sometime after 2010 and be implemented as a rolling transfer. Thus, there would be no sudden change in the local population but, rather, a gradual adjustment over several years. This combination of factors would minimize any impacts associated with the personnel transition.

Depending on the net changes in personnel for each alternative, it is assumed that military personnel and their dependents (e.g., spouses and children) would have to move or leave the region to relocate to other Navy installations. The number of military dependents affected by the proposed action was calculated using a national Navy/Marine Corps average for the percentage of married enlisted personnel and officers, by rank, and the average number of children by their parents' rank (*Facility Planning Criteria for Navy and Marine Corps Shore Installations, NAVFAC P-80*). These average percentages were applied to the number of enlisted personnel and officers who would be relocating under each of the alternatives to determine the corresponding number of dependents who would be affected (see Table 8-13).

The number of non-military dependents (e.g., dependents of civilians and contractors employed by MCBH Kaneohe Bay) who would be affected by the proposed action was calculated using the average family size for Honolulu County/Island of Oahu according to the 2005 American Community Survey (U.S. Census Bureau 2005). The average family size for Honolulu County/Island of Oahu was 3.46; subtracting one person (the civilian or contractor) from that figure produces an average of 2.46 dependents per civilian/contractor personnel. This average was then applied to the number of contractors and civilians who would be assumed to relocate to determine the corresponding number of dependents who would be affected (i.e., potentially relocating to the area) (see Table 8-13).

The total population losses under all alternatives are not significantly different when compared with the total population of Honolulu County. Although many of the individuals reside in the smaller towns immediately outside of the base boundary, there are many stationed and employed personnel who live in the city of Honolulu or elsewhere on the island of Oahu. Thus,

the entire county is used as the region of influence for this analysis. As seen in Table 8-13, the three potential population loss scenarios range from 0.2% to 0.5% of the total county population. The small loss under these alternatives is not considered a significant impact, especially in the context of the overall growth the island of Oahu has experienced and is projected to experience in future years.

#### **8.5.1.2 Housing: Alternatives 1 through 6**

Due to the relatively small change in the overall population of Honolulu County/island of Oahu associated with any of the proposed alternatives (0.5% or less) as noted above in Section 8.5.1.1, the housing market is not anticipated to be significantly affected. Existing housing vacancy rates are near 9% on the whole island and about 4% in the immediate vicinity of the base. In addition, the overall impact of potential population changes on the housing market would be minimized because most of the personnel who would be relocating out of the area are military personnel and their dependents, many of whom currently reside in Navy family housing or bachelor quarters. Moreover, with the pace at which the population has been growing, any vacancies created by military-related jobs moving out of the area would be quickly filled by individuals moving to the area.

#### **8.5.1.3 No Action Alternative**

Under the No Action Alternative, there would be no transition from the P-3C to the P-8A MMA; thus, no change in required personnel would take place. The existing base and regional population would not be directly impacted by the Navy action.

### **8.5.2 Economy**

#### **8.5.2.1 Alternatives 1 through 6**

The proposed action would impact the regional economy in two ways. First, under each alternative there would be a short-term, positive effect from funds injected into the regional economy through expenditures on the new construction and renovation projects that would be needed to support the P-8A MMA squadrons. However, there would also be a long-term, negative impact on the regional economy, primarily attributable to the loss of payroll and other station expenditures supporting businesses and services within the Honolulu County/island of Oahu

region. The one-time construction expenditures would not offset the recurring or annual loss in payroll and other station expenditures associated with the transitioning of the P-3C and P-8A MMA squadrons.

In order to quantify the total impact of the proposed alternatives on the regional economy, the Navy used regional input-output modeling system (RIMS II) multipliers. These multipliers are based on regional information derived from databases analyzing commercial, industrial, and household spending patterns and relationships and are specific to Honolulu County/island of Oahu. These multipliers also estimate the potential number of jobs created or lost as a result of changes in earning and spending patterns.

### **Short-Term Construction-Related Impacts**

Transitioning from the P-3C to the P-8A MMA would require upgrading, renovating, or constructing new facilities at MCBH Kaneohe Bay to accommodate the aircraft squadrons, personnel, and contractors. A list of construction components under the alternative scenarios at MCBH Kaneohe Bay is presented in Table 8-14. Major cost components include such items as a P-8A MMA hangar under Alternatives 1, 3, 4, 5, and 6 that would cost between \$112 and \$123 million, depending on the alternative selected, a Fleet Training Center under Alternatives 1, 3, 4, 5, and 6 for more than \$10 million, and various other items.

The specific years of construction would vary, depending on the alternative and transition scenario chosen. These construction activities would generate a number of jobs during the construction period and contribute to local earnings and indirect spending. Potential impacts associated with the proposed construction projects would include between 80 and 2,387 jobs resulting from the construction activities and associated spending, depending on the alternative chosen. Table 8-15 presents the multiplicative economic impacts of construction spending and an estimate of jobs created through this increase in spending.

Because these construction dollars represent a one-time expenditure, the resulting positive economic impacts would last only a short time. Once these funds leave the regional economy through savings, taxes, or purchases of goods and services outside the region, the positive effects would no longer be multiplied.

**Table 8-14 Cost of Construction at MCBH Kaneohe Bay (FY 2011 dollars)**

<b>Construction Component</b>	<b>Alternatives 1, 5, and 6</b>	<b>Alternative 2</b>	<b>Alternatives 3 and 4</b>
Fleet Training Center	\$10,634,710	-	\$10,634,710
Contractor Logistics Support	*	\$4,559,601	*
Aircraft Support Facility	-	**	-
P-8A MMA Hangar	\$123,989,379	-	\$112,955,474
Training Facilities	*	-	*
Aircraft Access Apron	\$3,291,908	-	\$3,291,908
Aircraft Rinse Facility	\$211,977	\$211,977	\$211,977
Compass Calibration Pad	\$155,263	\$155,263	\$155,263
Replace Building 6657	\$1,156,056	-	\$1,156,056
Replace Building 4054	\$7,512,485	-	\$7,512,485
Replace Facility 1669	\$505,529	-	\$505,529
<b>Total Construction Costs</b>	<b>\$147,457,305</b>	<b>\$4,926,840</b>	<b>\$136,423,401</b>

Note:

\* Cost for this line item is incorporated into the P-8A MMA hangar cost.

\*\* Cost for this line item is incorporated into the Contractor Logistics Support cost.

**Table 8-15 Regional Economic Impact Resulting from Proposed Renovation and Construction Projects (One-Time Costs) at MCBH Kaneohe Bay (FY 2011 dollars)**

	<b>Alternatives 1, 5, and 6</b>	<b>Alternative 2</b>	<b>Alternatives 3 and 4</b>
<b>Direct Economic Impacts</b>			
Expenditures (\$ million)	\$147.5	\$4.9	\$136.4
<b>Multiplied Economic Impacts</b>			
Expenditures (\$ million)	\$298.3	\$10.0	\$276.0
<b>Total Economic Impacts</b>			
Expenditures (\$ million)	<b>\$445.8</b>	<b>\$14.9</b>	<b>\$412.4</b>
<b>Employment Impacts (does not include MMA personnel)</b>			
Employment (jobs)	2,387	80	2,209

### **Long-Term Earnings-Related Impacts**

Transitioning from the P-3C to the P-8A MMA aircraft would require differently trained personnel to operate and maintain the aircraft and provide necessary support services. Table 8-16 summarizes the changes in employment and payroll at MCBH Kaneohe Bay under each of the alternative scenarios and the estimated regional economic impact that would result from the loss in annual or recurring spending of disposable income. Personnel and payroll would be reduced under Alternatives 1 through 6 at MCBH Kaneohe Bay; more specifically, a small increase in contractor/civilian personnel and a larger decrease in military personnel would result in a negative net change. Military personnel typically have a slightly different spending pattern

than do civilians and contractors because programs/benefits offered by the military (i.e., housing, base exchange, health care, etc.) are available; however, in this analysis, spending by civilians and military have been combined.

**Table 8-16 Regional Economic Impact (Annual) Resulting from Projected Change in Employment and Disposable Income at MCBH Kaneohe Bay (FY 2011 dollars)**

	<b>Alternatives 1, 5, and 6</b>	<b>Alternative 2</b>	<b>Alternatives 3 and 4</b>
<b>Direct Impacts</b>			
Employment (jobs)	(-)737	(-)1,594	(-)1,002
Earnings (\$ million)	(-) \$48.0	(-) \$122.9	(-) \$71.2
<b>Multiplied Impacts</b>			
Employment (jobs)	(-)379	(-)971	(-)562
Earnings (\$ million)	(-) \$45.5	(-) \$116.7	(-) \$67.5
<b>Total Impacts</b>			
Employment (jobs)	<b>(-)1,116</b>	<b>(-)2,565</b>	<b>(-)1,564</b>
Earnings (\$ million)	<b>(-) \$93.5</b>	<b>(-) \$239.6</b>	<b>(-) \$138.7</b>

Payroll expenditures were calculated for all personnel relocating from the area or transitioning into the area under each of the alternatives. The change in direct payroll expenditures for personnel stationed or employed at MCBH Kaneohe Bay is shown in Table 8-16. Each alternative would result in a loss of earned income in the region directly related to the military, ranging from approximately \$48.0 million under Alternatives 1, 5, and 6 to \$122.9 million under Alternative 2.

This reduction in personnel employed by MCBH Kaneohe Bay could, in turn, cause an annual reduction in residents' personal disposable income, a portion of which would normally be expected to be spent within the local community. The total, multiplied effect of the loss in earned income is also presented in Table 8-16. These impacts were calculated using RIMS II multipliers for average household spending in the region, based on disposable income 30% of payroll expenditures are assumed to be spent on taxes and savings).

The regional economic impact of the loss in personnel and payroll expenditures at MCBH Kaneohe Bay under Alternative 2 would have the most significant impact, with a combined loss of direct and indirect jobs of more than 2,565 and a total loss of earnings in the region of more than \$239 million. Total personal income earned in 2005 for Honolulu County was \$33.3 billion (U.S. Department of Commerce August 7, 2007). This amount in 2011 dollars

would be approximately \$38.0 billion; thus, the loss of personal income resulting from Alternative 2 would represent 0.6% of the total personal income earned in Honolulu County.

Despite a positive economic impact related to the construction spending associated with some of these alternatives, it is apparent that a large, annual reduction in earnings from the loss in jobs would outweigh the positive effects of the construction. This is especially true for Alternative 2, which would produce fewer positive impacts from construction expenditures and would also create the greatest negative economic impact from loss in jobs and wages. Alternatives 1, 5, and 6 would have the least negative economic impact at MCBH Kaneohe Bay because of the high level of construction expenditures at the base and the low loss of jobs and earnings.

#### **8.5.2.2 No Action Alternative**

Under the No Action Alternative the P-3C aircraft would not transition to the P-8A MMA; thus, no change in personnel would occur. The base payroll would remain as it is now and there would be no impact on the disposable income available in the local region as a result of a Navy action.

#### **8.5.3 Taxes and Revenues**

Under all alternatives, other than the No Action Alternative, the number of personnel at MCBH Kaneohe Bay is projected to decrease and all associated households are assumed to relocate away from the area. Relocation of households from the area is likely to result in a temporary loss of tax revenue for the city and county of Honolulu, where personnel stationed or employed at MCBH Kaneohe Bay reside.

However, as indicated in Section 8.5.1.1, the loss in population would represent only approximately 0.2% to 0.5% of the total Honolulu County/island of Oahu population. This small change, coupled with the historic and projected growth of the region, indicates that any loss of tax revenue collected would be quickly recouped as a result of other individuals moving to the area and essentially backfilling the population loss. In addition, the personnel change at MCBH Kaneohe Bay would consist of an increase in civilian and contractor personnel (who reside in the local community) and a larger decrease in military personnel (some of whom live on-base), which would further reduce the overall potential loss in tax revenue impacts. This impact is assumed to be small and short-term.



## **8.5.4 Education**

### **8.5.4.1 Alternatives 1 through 6**

The projected decrease in personnel stationed or employed by MCBH Kaneohe Bay under each of the proposed alternatives would result in a corresponding decrease in the number of school-aged children in the area because these families are assumed to relocate. The slight increase in civilian and contractor personnel (and their dependents) would be more than offset by the decrease in the military personnel (and their dependents), creating a net loss under each alternative.

The projected decrease in the number of school-aged children in the area could have a significant impact on enrollment within the Kalaheo Complex of the Hawaii Department of Education (see Table 8-17). Given the size of the school district (seven schools serving 4,172 students as of the 2005-2006 school year), the projected loss of school-aged children under Alternative 2 would represent a 17% decrease in the total enrollment for the school complex<sup>1</sup>.

**Table 8-17 Projected Change in Number of School-Aged Children Resulting from P-8A MMA Personnel Transition at MCBH Kaneohe Bay**

	<b>Alternatives 1, 5, and 6</b>	<b>Alternative 2</b>	<b>Alternatives 3 and 4</b>
Military Personnel	(-)877	(-)1,566	(-)1,086
School-Aged Military Dependents	(-)359	(-) 750	(-)464
Civilian and Contractor Personnel	140	(-) 38	81
School-Aged Non-Military Dependents	76	(-) 21	44
<b>Total School District Enrollment (Percent Change)</b>	<b>(-)6.8%</b>	<b>(-)17.3%</b>	<b>(-)10.1%</b>
<b>Total School-Aged Children</b>	<b>(-)283</b>	<b>(-)721</b>	<b>(-)420</b>

Military school-aged enrollment losses would be concentrated in specific schools that have a history of high enrollment from MCBH Kaneohe Bay. The changes in the number of civilian/contractor school-aged dependents would be spread farther throughout Oahu, assuming that the parents would like to live close to the base where they would be employed, but could live in areas closer to Honolulu or elsewhere on the island. Thus, the overall impact on specific

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<sup>1</sup> The greatest change under any alternative is a decrease of 721 (Table 8-17, Alternative 2) divided by 4,172 total enrollment, which equals 17.3%.

schools is difficult to determine, but it is evident that impacts on the school district could be significant and adjustments in the schools that children attend may need to be addressed to maintain efficient levels of capacity and teacher-to-student ratios.

The reduction in “federally connected students” attending the district schools would result in a corresponding reduction in federal aid received by the district. However, this reduction in aid is not expected to have a significant fiscal impact because federal aid typically does not cover the full per-pupil costs received by the district.

#### **8.5.4.2 No Action Alternative**

Under the No Action Alternative, the P-3C would not transition to the P-8A MMA and no change in required personnel would take place. The base personnel numbers would remain as they are now and there would be no associated change in the number of military or contractor/civilian personnel dependents; thus, there would be no impact on education.

#### **8.5.5 Impacts on Minority and Low-Income Populations and Environmental Health and Safety Risks to Children**

Consistent with Executive Orders 12898 and 13045, and as discussed in Section 7.5.5, the Navy’s policy is to identify disproportionately high and adverse human health or environmental effects of its actions on minority and low-income populations and the environmental health risks and safety effects on children. This analysis focuses on the potential for exposure of minority and low-income populations and children to the projected aircraft noise associated with the alternatives. The alternative selected for this analysis is the one that would result in the largest number of individuals exposed to the greater-than-65 dB DNL noise contour which, at MCBH Kaneohe Bay, would be the airborne noise generated by Alternatives 1 through 6, with three fleet squadrons proposed. Under this scenario, about 1,768 acres of on- and off-base land would be within the 65 dB DNL noise contour. Although the analysis examines only the potential effects associated with these alternatives, the results of evaluating any of the other alternatives evaluated in this EIS for MCBH Kaneohe Bay would be similar to the results of Alternatives 1 through 6. Thus, the analysis represents the most conservative risk for potential environmental justice and environmental health and safety impacts.

Tables 8-18, 8-19, and 8-20 provide demographic and economic data for all census tracts that are wholly or partially within the greater-than-65 dB DNL noise contours under Alternatives 1 through 6. These demographic and economic data were compared with similar demographic and economic data for the entire island of Oahu/Honolulu County (see Section 7.5.5) to determine whether the proposed action would have disproportionately high and adverse effects on minority and low-income populations or pose environmental health or safety risks to children. Where the minority and low-income populations or number of children within the identified affected area exceeds 50%, or the percentage of minority or low-income populations or children exceeds the comparable percentage of these populations in the community of comparison (i.e., the city or county), the population exposed is considered to receive a disproportionately high and adverse effect or to sustain an environmental health or safety risk.

**Table 8-18 Total Persons by Race and Hispanic Origin for all 2000 Census Tracts within or Partially within the Greater-than-65 dB DNL Noise Zone at MCBH Kaneohe Bay under Alternatives 1 through 6 (3 Fleet Squadrons)**

Census Tract <sup>a</sup>	Total Persons	Percent Hispanic	Percent Minority
10505	3,512	4.6%	77.5%
Honolulu County	876,156	6.7%	78.8%
State of Hawaii	1,211,537	7.2%	75.9%

Note:

<sup>a</sup> Does not include MCBH Kaneohe Bay Census Tract.

**Table 8-19 Percent of Population Considered Low Income in Each 2000 Census Tract Within or Partially Within the Greater-than-65 dB DNL Noise Zone at MCBH Kaneohe Bay under Alternatives 1 through 6 (3 Fleet Squadrons)**

Census Tract <sup>a</sup>	Total Population	Percent Considered Low-Income (Below Poverty)
10505	3,512	0.7%
Honolulu County	876,156	9.9%
State of Hawaii	1,211,537	10.7%

Source: U.S. Census Bureau 2000.

Note:

<sup>a</sup> Does not include MCBH Kaneohe Bay Census Tract.

**Table 8-20 Percent of Population Considered Children in Each 2000 Census Tract Within or Partially Within the Greater-than-65 dB DNL Noise Zone at MCBH Kaneohe Bay under Alternatives 1 through 6 (3 Fleet Squadrons)**

<b>Census Tract<sup>a</sup></b>	<b>Population</b>	<b>Percent Considered Children (Under 18 years of age)</b>
10505	3,512	21.0%
Honolulu County	876,156	23.7%
State of Hawaii	1,211,537	24.3%

Source: U.S. Census Bureau 2000.

Note:

<sup>a</sup> Does not include MCBH Kaneohe Bay Census Tract.

### **8.5.5.1 Minority Populations**

Minority populations are defined by Executive Order 12898 as individuals who are Black/African-American (not of Hispanic origin), Asian or Pacific Islander, American Indian or Alaskan Native, or Hispanic. As shown in Table 8-18 (see also Section 7.5.5), in 2000 these minority populations in Honolulu County comprised 78.8% of the population, an extremely high percentage when compared with the mainland United States; however, Honolulu County and the State of Hawaii in general have a unique demographic makeup. There is, naturally, a significant presence of Native Hawaiian and other Pacific Islanders as well as Asian populations. Although these make up the majority of the population on Oahu, they are still considered a minority population. Figure 8-5 shows the locations of census tracts in the vicinity of MCBH Kaneohe Bay and their relationship to the modeled projected noise contours under Alternatives 1, 5 and 6.

Only one census tract in the community surrounding MCBH Kaneohe Bay would be affected by the 65 dB DNL noise contour under Alternatives 1, 5, and 6. This census tract is to the southwest of the airfield and contains Coconut Island as its only land area within the noise contours. Coconut Island serves as a marine research institute for the University of Hawaii and provides temporary housing for faculty, staff, and students. The remainder of the census tract has a very high percentage of minority population (77.5%), although it is lower than the average for the entire Honolulu County. Based on this analysis, this census tract as a whole would be considered to receive a disproportionate, high, and adverse impact because the percentage of the minority population is more than 50%, although the percentage of Hispanics is below that of the community of comparison, Honolulu County, at 6.7%. However, further review shows that this census tract is already within the greater-than-65 dB DNL noise contour under the baseline envi-

ronment. In other words, there would be no difference between baseline and future noise conditions if the proposed action were implemented.

#### **8.5.5.2 Low-Income Populations**

The Council on Environmental Quality (1997) defined low-income populations as the populations considered by the U.S. Census Bureau to be “below poverty level.” The number of individuals below poverty level (low-income) was obtained for each census tract that was wholly or partially within the greater-than-65 dB DNL noise contour under Alternatives 1 through 6 at MCBH Kaneohe Bay. Table 8-19 presents the low-income statistics for the census tracts identified in Figure 8-5.

As shown in Table 8-19, under Alternatives 1 through 6 there is one census tract within the area encompassed by the greater-than-65 dB DNL noise contour at MCBH Kaneohe Bay. This census tract has a very low population below poverty and is less than that of the community of comparison. For this reason, the proposed action would not have a disproportionately high or adverse environmental or human health impact on low-income populations.

#### **8.5.5.3 Children**

For the purposes of this analysis, children were defined as individuals under the age of 18 years. These statistics were obtained for each census tract that was wholly or partially within the greater-than-65 dB DNL noise contour under Alternatives 1 through 6 at MCBH Kaneohe Bay. Figure 8-5 shows the impacted census tracts and Table 8-20 presents the statistics for each census tract.

Under Alternatives 1 through 6 one census tract would be potentially impacted by the 65 dB DNL noise contour. This census tract’s population of children is less than that of the community of comparison (21.0% compared with 23.7%). Thus, the proposed action would not pose potential environmental health or safety risks to children.

### **8.6 Infrastructure and Utilities**

As noted in Section 7, infrastructure and utilities would not be affected by the proposed action and so are not discussed in this EIS.

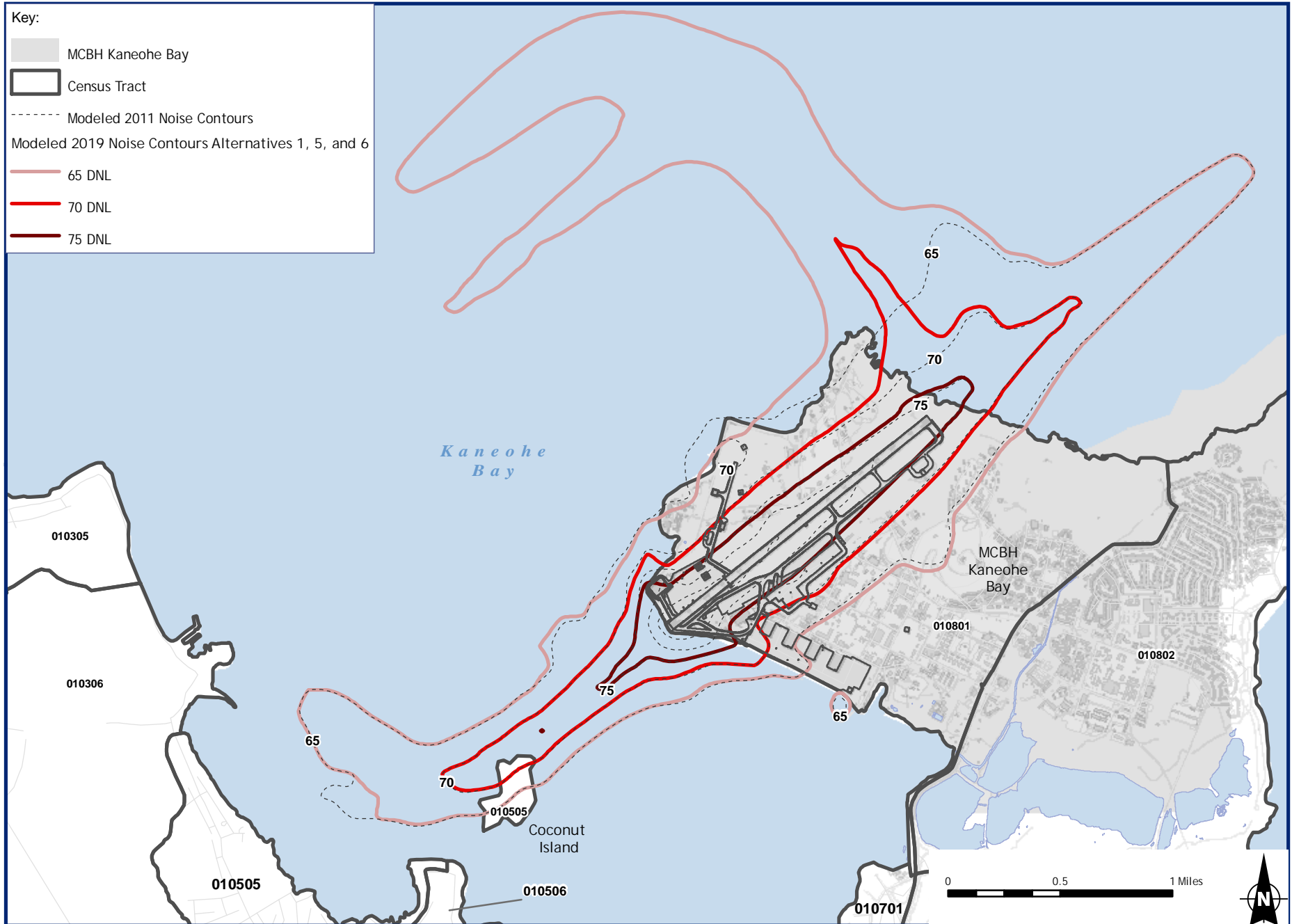


Figure 8-5  
 2000 Census Tracts Wholly or Partially within Modeled 2011 DNL Noise Contours  
 and 2019 DNL Noise Contours Projected Under Alternatives 1,5, and 6  
 MCBH Kaneohe Bay, Hawaii

## **8.7 Community Services**

As noted in Section 7, community services would not be affected by the proposed action and so are not discussed in this EIS.

## **8.8 Transportation**

As noted in Section 7, transportation would not be affected by the proposed action and so is not discussed in this EIS.

## **8.9 Topography and Soils**

Topography at MCBH Kaneohe Bay would not be affected by the proposed action because the proposed site for new construction is generally level, and significant grading would not be required.

Soils at the proposed construction sites would be temporarily affected by the proposed action. Impacts would include a potential for soil erosion and compaction and rutting from vehicle traffic during construction. The projected increase in impervious surface from 4.0 acres under Alternatives 3 and 4 to 4.1 acres under Alternatives 1, 5, and 6 would increase the quantity and velocity of storm water runoff, which would increase the susceptibility of surrounding soils to erosion. These impacts would be minimized or avoided by using standard soil erosion- and sedimentation-control techniques at the construction sites, such as silt barriers (filter fabric), and by appropriate revegetation techniques upon completion. Revegetation techniques would include replanting disturbed areas with native plants and specific seed mixtures approved through the Natural Resource Conservation Service (NRCS). Consequently, potential impacts on soils at MCBH Kaneohe Bay would be minor and temporary.

Under Alternative 2, topography and soils would not be affected because new facilities would be constructed over existing paved areas. Under the No Action Alternative no additional facilities would be constructed to support current operations; therefore, topography and soils would not be affected.

## **8.10 Water Resources and Wetlands**

### **8.10.1 Surface Water**

No perennial water bodies are present within or immediately adjacent to the proposed construction area at MCBH Kaneohe Bay; therefore, the proposed action would have no direct effects on surface water bodies.

### **8.10.2 Water Quality**

Construction of the facilities to support the basing of P-8A MMA at MCBH Kaneohe Bay would require a construction footprint of approximately 3 acres under Alternative 2 and 6.1 acres under Alternatives 1, 3, 4, 5, and 6. With proper mitigation, storm water runoff from the construction sites would not impact water quality in Kaneohe Bay. Because more than 1 acre would be disturbed during construction under all replacement alternatives and, because Kaneohe Bay waters are classified as Class AA waters, an individual National Pollutant Discharge Elimination System (NPDES) permit for the discharge of storm water from construction activities would be required from the State of Hawaii Department of Health. Under the permit, the Navy would submit a site-specific Storm Water Pollution Control Plan (SWPCP) (also referred to as a Storm Water Pollution Prevention Plan [SWPPP]) that would include a site plan for managing storm water runoff. The plan would also describe the best management practices (BMPs) to be implemented to eliminate or reduce erosion, sedimentation, and storm water pollutants. Examples of storm water BMPs that may be used include:

- **Grass swales.** Temporary or permanent features designed to filter and reduce storm water runoff from construction areas;
- **Silt fencing.** A temporary erosion and sediment control used to prevent dirt from entering waterways before bare soil is stabilized with vegetation; and
- **Berms.** A temporary erosion and sediment control that physically prevents polluted runoff from entering nearby storm drain inlets and waters.

Most of the proposed facilities at MCBH Kaneohe Bay have been sited on existing paved areas to maximize the use of existing infrastructure and minimize the amount of storm water runoff. The new construction to support the P-8A MMA would create approximately 4 acres of new impervious surface under Alternatives 3 and 4 and 4.1 acres under Alternatives 1, 5, and 6. This surface would, on the average, generate an additional 4.56 million gallons of runoff per year



under Alternatives 3 and 4 and 4.67 million gallons of runoff per year under Alternatives 1, 5, and 6. No new storm water outfalls are expected to be required to support the new construction. Rather, once the facilities are constructed, storm water from the new impervious surface would be directed to the existing storm water conveyance system via box culverts, sewer lines, or grass-lined swales for final discharge into Kaneohe Bay. Based on the sensitivity of Kaneohe Bay as Class AA waters, the Navy will implement site-specific BMPs to minimize the quantity of storm water that is transported from the new construction areas.

In 1996 the *Realignment of Military Organizations to Marine Corps Base Hawaii* environmental assessment (EA) analyzed storm water impacts on Kaneohe Bay associated with creating approximately 28 acres of new impervious surface at the base. A Finding of No Significant Impact was issued and it was determined that the new impervious surface would not impact the surrounding marine environment. Under the P-8A MMA proposed action, adverse impacts on Kaneohe Bay and other surface waters surrounding the base would be avoided by following similar guidelines as identified in the 1996 EA, utilizing BMPs and implementing storm water management practices as specified in the installation's Storm Water Management Plan (SWMP). With proper implementation of this plan, impacts on water quality from erosion and off-site sedimentation during and after completion of construction and during operations would be negligible. Regulatory agencies have concurred with the Navy that this proposed action would have no significant impact on Kaneohe Bay (see Appendix J, Agency Correspondence).

Because Kaneohe Bay is classified as Class AA waters, the base's current NPDES permit (Permit No. HI 0110078) includes restrictions on the amount of storm water that may be discharged to the bay. Notwithstanding the small amount of new impervious surface that would be added to the base under all replacement alternatives and the ability to minimize storm water transport through the implementation of certain BMPs (e.g., grass-lined swales), any additional storm water runoff from the proposed action would require a revision of the station's current NPDES permit. Adverse impacts on Kaneohe Bay and other surface waters surrounding the station would be avoided to the greatest extent possible by implementing site-specific BMPs and other storm water management practices as specified in the base SWMP. As part of the SWMP, sampling is regularly conducted to ensure that storm water discharges meet state water quality standards.

Under the No Action Alternative no additional facilities would be constructed to support current operations; therefore, water quality would not be affected.

### **8.10.3 Floodplains**

The proposed construction sites are not located within or adjacent to any mapped 100-year floodplains. Consequently, the proposed action would have no effect on the 100-year base flood elevation at the base.

Although not located within a designated floodplain, the proposed construction area experiences temporary flooding when it rains. The storm water management plan that would be prepared for the new development would include measures to alleviate flooding on the site.

Under the No Action Alternative no additional facilities would be constructed to support current operations; therefore, the 100-year floodplain would not be affected.

### **8.10.4 Groundwater**

The proposed action would not impact groundwater resources in the vicinity of MCBH Kaneohe Bay. None of the proposed construction at the base would extend below surface at a depth that would impact the underlying water table. The potential exists for spills of fuel or other chemicals during construction; however, immediate cleanup of these spills would prevent any infiltration into the underlying groundwater. Since the number of personnel employed or stationed at MCBH Kaneohe Bay would decrease slightly under each of the replacement alternatives, there would be a corresponding slight decrease in demand for groundwater from the regional aquifer system.

Under the No Action Alternative no additional facilities would be constructed to support current operations; therefore, groundwater resources would not be affected.

### **8.10.5 Wetlands**

The proposed action would have no impact on wetlands at MCBH Kaneohe Bay under any of the replacement alternatives because no wetlands are located on or adjacent to the proposed construction areas.

Under the No Action Alternative no additional facilities would be constructed to support current operations; therefore, wetlands would not be affected.

## **8.11 Biological Resources**

### **8.11.1 Vegetation**

Construction of new facilities at MCBH Kaneohe Bay to support the P-8A MMA under all replacement alternatives would have a minor effect on vegetation. A portion of new construction under Alternatives 1, 3, 4, 5, and 6 would be located on paved areas that do not support any existing vegetative cover. Approximately up to 4 acres of maintained Bermuda grass adjacent to existing developed areas would be removed under Alternatives 1, 3, 4, 5, and 6. The vegetation permanently removed under all alternatives would total less than 1% of the currently vegetated area at the base. Furthermore, no unique or natural vegetation communities would be affected by the proposed action at MCBH Kaneohe Bay. Alternative 2 would have no effect on vegetation at the base because all construction would be located on existing paved areas.

Under the No Action Alternative no additional facilities would be constructed to support operations; therefore, vegetation would not be affected.

### **8.11.2 Wildlife**

The proposed construction areas at MCBH Kaneohe Bay do not provide suitable habitat to support a diverse or abundant terrestrial wildlife population because there is little vegetation cover or habitat diversity. Thus, the construction projects at the base under all replacement alternatives would have a negligible effect on terrestrial wildlife.

The proper implementation of measures (outlined in Section 7.10) to control storm water runoff from construction sites and new impervious surfaces would prevent the degradation of water quality in the marine waters surrounding the base. In addition, BMPs employed during construction would prevent silt from entering the storm water system and subsequent silting in sensitive coral reef habitats. Therefore, storm water from construction activities would have no impact on coral reef colonies or other aquatic species within Kaneohe Bay and other marine waters.

As discussed in Section 8.10.2, storm water created as a result of the new impervious surfaces will be mitigated to the greatest extent possible through the implementation of BMPs. Also, no additional outfalls are expected to be installed to accommodate storm water discharge. Consequently, any impacts on coral reef colonies or other aquatic species from additional storm

water discharge are expected to be minor and highly localized, given the small area of new impervious surface added at the base, implementation of on-site BMPs to reduce storm water runoff, and rapid dispersion of storm water in the marine environment. These findings are based on the analyzed storm water impacts on Kaneohe Bay associated with creating approximately 28 acres of new impervious surface at the base (Marine Corps 1996). A Finding of No Significant Impact was issued and it was determined that the new impervious surface would not impact the surrounding marine environment. Monitoring implemented subsequent to the EA confirmed that there were minimal impacts on coral reefs from the increase in storm water discharge. Under the P-8A MMA proposed action, adverse impacts on Kaneohe Bay and other surface waters surrounding the base would be avoided by following similar guidelines as identified in the 1996 EA, utilizing BMPs and implementing storm water management practices as specified in the installation's SWMP. With proper implementation of this plan, impacts on water quality from erosion and off-site sedimentation during and after completion of construction and during operations would be negligible. Regulatory agencies have concurred with the Navy that this proposed action would have no significant impact on Kaneohe Bay (Marine Corps 1996).

The following operational factors associated with each of the replacement alternatives at MCBH Kaneohe Bay were considered in evaluating the potential for effects on wildlife:

- There would be a decrease in the annual number of flight operations as per the P-8A MMA flight syllabus under each alternative.
- There would be no significant change in the type, location, or current ratio of daytime and nighttime operations as per the P-8A MMA flight syllabus.
- While the P-8A MMA is approximately 1 dB louder than the P-3C during takeoff, the P-8A MMA climbs faster on departure than does the P-3C, resulting in a comparable noise impact on the ground.
- The P-8A MMA is approximately 2 dB louder than the P-3C during landing, causing a slightly higher, yet still comparable, noise impact on the ground.

Studies that have focused on investigating the impacts of aircraft noise on wildlife and domestic animal species have involved observations of a variety of species, including waterfowl, shore birds, song birds, terrestrial mammals, marine mammals, and domestic animals (cows, chickens, sheep, and horses). Summaries of the existing literature suggest that there is not enough information about cause-and-effect relationships between aircraft noise, physiological effects, and resultant behavioral responses. However, numerous studies have reported that be-

havioral responses to aircraft noise appear to be species-specific (Manci et al. 1988). It is therefore difficult to draw conclusions from the effects or responses of aircraft noise on one species and predict those responses for other species.

All species (those previously not exposed to aircraft noise), however, seem to respond initially with some form of a startle response, the intensity and duration of which diminishes or disappears with subsequent exposures. Other general responses include running, stampeding, flying, circling, or becoming motionless. Most studies indicate that there is a strong tendency for species to acclimate or habituate to noise disturbances (Grubb and King 1991; Ellis et al. 1991; Manci et al. 1988; Fraser et al. 1985; Fleming et al. 1985; Black et al. 1984). Given the nature of the current MCBH Kaneohe Bay operations, locally occurring wildlife species have likely become habituated to aircraft noise. Consequently, as result of the predicted slight increase in noise levels under the replacement alternatives, negligible impacts on local wildlife populations are anticipated.

Under the No Action Alternative no additional facilities would be constructed to support current operations; therefore, wildlife would not be affected.

#### **8.11.2.1 Migratory Birds**

As mentioned in Section 7, Existing Environment: MCBH Kaneohe Bay, Section 7.11, routine operation and maintenance of P-8A MMA at the airfield and proposed construction of support infrastructure are not exempt from the take prohibitions of the Migratory Bird Treaty Act (MBTA) (Rule 72 Federal Register [FR] 56926). As noted above in the discussion of wildlife impacts, the predicted minor increase in noise levels is anticipated to cause negligible impacts on local wildlife populations, including migratory bird species. Furthermore, the proposed new construction would not directly affect any species of migratory birds or remove habitat that is important to migratory bird populations (see Section 8.11.1). The MCBH Kaneohe Bay Bird-Aircraft Strike Hazard (BASH) Plan and INRMP also provide project and operations guidance to aid in MBTA compliance.

#### **8.11.2.2 Bird-Aircraft Strike Hazard**

No aspect of the proposed action would create attractants that would have the potential to increase the concentration of birds in the vicinity of the airfield. Therefore, considering the

slight increase or decrease in annual operations and use of existing flight tracks, no increase in the BASH risk would occur at MCBH Kaneohe Bay.

### **8.11.3 Threatened and Endangered Species**

#### **8.11.3.1 Aquatic Species**

Six of the seventeen federally listed threatened and endangered species identified as potentially occurring on or in the immediate vicinity of MCBH Kaneohe Bay are either aquatic species or species closely associated with the marine environment, including the Hawaiian monk seal, humpback whale, sperm whale, Newell's shearwater, green sea turtle, and hawksbill sea turtle. None of the proposed construction activities at MCBH Kaneohe Bay would directly affect any of the aquatic habitats that could be inhabited by these species. Furthermore, the proper implementation of measures outlined in Section 7.10 to control storm water runoff from construction sites would prevent the degradation of water quality in the marine waters surrounding the base.

As discussed in Section 8.3.4 and shown in Tables 8-8 and 8-10, the greater-than-65 dB DNL noise zone under Alternatives 1 and 3 through 6 would cover between 633 and 936 additional acres of marine waters surrounding MCBH Kaneohe Bay. However, the highest noise levels (e.g., greater-than-75 dB DNL) would still be contained on land within the boundary of MCBH Kaneohe Bay. Furthermore, as discussed in Section 8.2, the P-8A MMA is approximately 3-7 dB SEL louder than the P-3C during air operations. Therefore, marine species in the vicinity of MCBH Kaneohe Bay would be exposed to noticeable, yet still comparable, single-event noise levels during P-8A MMA operations, compared with current operations completed by P-3C aircraft.

The production and reception of certain sounds are critical in various aspects of marine mammal life history; certain sounds (both natural and anthropogenic) have the potential to interfere with marine mammal life functions, e.g., feeding, breeding, and social interactions (Southall April 27, 2005). In a summary by the National Park Service (September 12, 1994) on the effects of noise on marine mammals, it was determined that gray whales showed no outward physical behavioral response to aircraft noise or overflights. Other anthropogenic noises in the marine environment may have more of an effect on marine mammals than aircraft noise (U.S. Air Force

July 20, 2000). The noise effect on cetaceans appears to be somewhat attenuated by the air/water interface. The cetacean fauna along the coast of California have been subjected to sonic booms from military aircraft for many years without apparent adverse effects (Tetra Tech, Inc. July 1997). Eller et al. (June 2000) concluded that there are very few and limited cases for which there could be any risk of injury to or harassment of a marine mammal from underwater noise generated by subsonic flight of Air Force aircraft. Zhang et al. (2003) found that the area exposed to noise from low-flying military jets is concentrated in a narrow vertical column that dissipates rapidly with horizontal distance. This narrow noise-exposure cone, combined with the high speed of the aircraft, results in elevated noise levels in the water column for only a few tenths of seconds. Consequently, aircraft are thought to have a much smaller potential for impacting marine mammals compared with other sources of underwater noise, including ship traffic, drill rigs, and seismic surveys. Finally, Gilmartin (2003) found that exposure to noise from very low-flying aircraft does not always alarm or cause hauled-out monk seals to flee into the water.

In conjunction with these studies, and considering the continuance of type, location, and current ratio of daytime and nighttime operations, the projected increase in the 65 to 75 dB DNL noise levels over water would not disturb any critical aspects of marine mammal life functions nor interfere with the foraging activity of any of the protected aquatic species in the vicinity of MCBH Kaneohe Bay. Consequently, the Navy has determined that operations of the P-8A MMA would have no effect on Endangered Species Act (ESA)-listed aquatic species in the vicinity of MCBH Kaneohe Bay (Appendix M).

Any increase in storm water discharge from the addition of up to 4.1 acres of new impervious surface at MCBH Kaneohe Bay may affect, but is not likely to adversely affect, the humpback whale or sperm whale because these species would not be present in the immediate vicinity of the shoreline near storm water outfalls. Likewise, increased storm water discharge may affect, but is not likely to adversely affect Newell's shearwater although this species is more likely to forage offshore. The Hawaiian monk seal, green sea turtle, and hawksbill sea turtle could potentially forage near the shoreline and therefore be affected by changes in water quality related to storm water discharge. However, any impacts are expected to be minor and highly localized, given the small area of new impervious surface added at the base, implementation of on-site

BMPs to reduce storm water runoff, and rapid dispersion of storm water in the marine environment. Consequently, the Navy has determined that the proposed action may affect, but is not likely to adversely affect, the Hawaiian monk seal, green sea turtle, and hawksbill sea turtle. The Navy conferred with the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS) in letters dated June 10, 2008 (see Appendix E) regarding the additional storm water input, noise effects, and determination of effects. The NMFS concurred with the Navy's finding in a letter dated July 25, 2008. The Navy sent additional clarifying information to the NMFS on September 24, 2008 detailing modifications to the proposed construction layout. In an email dated October 1, 2008, NFMS maintained their previous determinations of effects (see Appendix E).

#### **8.11.3.2 Hawaiian Hoary Bat (Ōpeapea)**

As noted in Section 7.11.3, there are no incidental records of hoary bats on the Mokapu Peninsula and this species has not been documented at MCBH Kaneohe Bay. Moreover, no habitats on the base that could potentially support the occurrence of this species would be affected by construction activities under any of the replacement alternatives. Therefore, the Navy has determined that basing P-8A MMA at MCBH Kaneohe Bay under any of the alternatives would have no effect on the Hawaiian hoary bat.

#### **8.11.3.3 Hawaiian Stilt, Hawaiian Common Moorhen, Hawaiian Coot, and Hawaiian Duck**

The Nuupia Ponds wildlife management area (WMA) on MCBH Kaneohe Bay provides important nesting and/or foraging habitat for each of these endangered waterbirds (see Section 7.10.4). The proposed construction at the base to support the P-8A MMA basing would be located more than 0.5 miles northwest of the Nuupia Ponds WMA boundary. Consequently, no habitat used by the endangered waterbirds would be directly impacted by construction disturbance or indirectly affected by construction noise. In addition, no indirect impacts on aquatic habitats would occur because storm water runoff would not be directed to any surface waters within the WMA.

Given the nature of the current MCBH Kaneohe Bay operations, waterbirds occupying the base have likely become habituated to aircraft noise. Considering that there would be a 10%



to 40% decrease in the annual number of flight operations and no change in the type, location, or current ratio of daytime and nighttime operations, the projected slight increase in noise levels at the base is not anticipated to disrupt waterbird foraging or nesting behavior. Based on the above analysis, the Navy has determined that basing P-8A MMA at MCBH Kaneohe Bay under any of the alternatives would have no effect on the Hawaiian stilt, Hawaiian common moorhen, Hawaiian coot, and Hawaiian duck.

#### **8.11.3.4 Round-leaved Chaff-Flower (Ewa hinahina), Puukaa, White Hibiscus (Kokio keokeo), Yellow Hibiscus (Mao hau hele), Loulu Palm, and Ohai**

None of the proposed construction projects at MCBH Kaneohe Bay under any of the replacement alternatives would disturb habitats that are known to or could potentially support any of these endangered plant species. Consequently, the Navy has determined that basing P-8A MMA at MCBH Kaneohe Bay under any of the alternatives would have no effect on round-leaved chaff-flower, Puukaa, white hibiscus, yellow hibiscus, Loulu palm, and Ohai.

#### **8.11.3.5 Other Species of Concern**

Other species of concern on or in the immediate vicinity of MCBH Kaneohe Bay include the short-eared owl, Hawaiian reef coral, and the inarticulate brachiod. The short-eared owl could potentially forage on or near the vegetated construction areas. The loss of up to 4 acres of maintained lawn at the base would have no effect on this species. Furthermore, this species would not be disturbed by construction activities because it would avoid the construction work areas.

As previously discussed, BMPs employed during construction would prevent silt from entering the storm water system and subsequently silting in sensitive coral reef habitats. Therefore, construction activities would have no effect on coral reef colonies or other aquatic species within Kaneohe Bay and other marine waters.

#### **8.11.4 Marine Mammals**

Species protected under the Marine Mammal Protection Act (MMPA) known to occur in the marine waters adjacent to MCBH Kaneohe Bay include the Hawaiian monk seal, humpback

whale, sperm whale, short-finned pilot whale, and the Hawaiian spinner dolphin. As discussed above, the humpback whale and sperm whale would not be affected by construction activities or aircraft operations at MCBH Kaneohe Bay under any of the replacement alternatives. Based on the analysis presented above, the same impact assessment applies to the short-finned pilot whale and Hawaiian spinner dolphin. Increased storm water discharges into Kaneohe Bay could have a minor and highly localized impact on Hawaiian monk seals foraging along the western shoreline of MCBH Kaneohe Bay. Consequently, the Navy has determined that the proposed action would not result in reasonably foreseeable “takes” of a marine mammal species by harassment or injury or mortality as defined under the MMPA.

## **8.12 Cultural Resources**

### **8.12.1 Architectural Resources**

Effects on historic resources listed in or eligible for listing in the National Register for Historic Places (NRHP) are evaluated with regard to the *Criteria of Effect and Adverse Effect*, established by the Advisory Council for Historic Preservation (ACHP) (36 Code of Federal Regulations [CFR] 800.9). These criteria are listed in Table 8-21.

As discussed in Section 7.12.1, 236 buildings built on the base before 1952 have been listed or have been determined to be eligible for listing in the NRHP due to their association with the December 7, 1941 attack, which was the start of U.S. involvement in World War II. Of these, Hangar 101, located south of the airfield, and the adjacent seaplane ramps extending into Kaneohe Bay are listed on the NRHP and together are classified as National Historic Landmarks. None of these NRHP-eligible and listed buildings would be physically altered as a result of the proposed construction activities under any of the replacement alternatives; however, other buildings may become eligible for listing in the NRHP before the start of the proposed construction actions. An NRHP-eligibility assessment is ongoing for buildings built between 1952 and 1965. It is unlikely any of these post-World War II buildings would be determined to be NRHP-eligible; however, if more buildings become eligible, the Navy and MCBH Kaneohe Bay would continue Section 106 consultation with the Hawaii SHPO and other consulting parties to minimize any effects that may result from the proposed actions and alternatives. Furthermore, the

new construction would be located at a sufficient distance from the NRHP-eligible and listed buildings such that these resources would not produce any adverse viewshed effects.

**Table 8-21 Criteria for Adverse Effects on Historic Properties**

<b>Criteria for Adverse Effects</b>
<p>“An adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property’s location, setting, materials, workmanship, feeling, or association. Consideration shall be given to all qualifying characteristics of a historic property, including those that may have been identified subsequent to the original evaluation of the property’s eligibility for the National Register. Adverse effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance or be cumulative” (36 CFR 800.5[a][1]).</p>
<b>Examples of Adverse Effects</b>
<p>“Adverse effects on historic properties include, but are not limited to:</p> <ol style="list-style-type: none"><li>1. Physical destruction of or damage to all or part of the property;</li><li>2. Alteration of a property, including restoration, rehabilitation, repair, maintenance, stabilization, hazardous material remediation and provision of handicapped access, that is not consistent with the Secretary’s Standards for the Treatment of Historic Properties (36 CFR Part 68) and applicable guidelines;</li><li>3. Removal of the property from its historic location;</li><li>4. Change of the character of the property’s use or of physical features within the property’s setting that contribute to its historic significance;</li><li>5. Introduction of visual, atmospheric or audible elements that diminish the integrity of the property’s significant historic features;</li><li>6. Neglect of a property which causes its deterioration, except where such neglect and deterioration are recognized qualities of a property of religious and cultural significance to an Indian tribe or Native Hawaiian organization;</li><li>7. Transfer, lease, or sale of property out of Federal ownership or control without adequate and legally enforceable restrictions or conditions to ensure long-term preservation of the property’s historic significance” (36 CFR 800.5[a][2]).</li></ol>

A study of the potential for aircraft noise to affect the structural components of historical buildings, *Assessment of Potential Structural Damage from Low-Altitude Subsonic Aircraft* (Sutherland 1989), showed there is little probability of structural damage occurring as a result of

low-altitude, high-speed aircraft operations. In addition, there are no historical data in the *Integrated Cultural Resources Management Plan for Marine Corps Base Hawaii* that document damage to historic structures caused by noise vibrations from aircraft operations. As indicated by the Sutherland study and past experience, there would be no vibration-related effects on historic properties at the base as a result of the slight increase in noise exposure.

Therefore, in accordance with the Advisory Council's regulations concerning the criteria of effect, the Navy has concluded that the proposed action would have no adverse effect on historic resources. Consultation with the Hawaii SHPO consistent with the National Historic Preservation Act (NHPA) Section 106 consultation process was initiated in a letter dated August 30, 2007. The Navy sent a follow-up letter on September 11, 2008 including a determination that the proposed construction will not result in any adverse effects on historic properties.

### **8.12.2 Archaeological Resources**

The various footprints of the proposed conceptual design of the P-8A MMA alternatives are located within a medium archaeological sensitivity zone as identified in the installation's ICRMP (U.S. Army Corps of Engineers 2006). A previous archaeological project conducted within the boundary of the MMA proposed action recorded buried archaeological deposits, which were designated as site 4933. The area above site 4933 is currently an asphalted parking apron for aircraft. The proposed action is to continue using the surface as a parking apron; no new construction would occur in the vicinity of site 4933.

The Navy would complete an archaeological inventory survey with subsurface testing of these construction sites prior to construction to document the presence or absence of archaeological resources. The results of the archaeological inventory survey would be used to mitigate the potential effects the proposed undertaking may have on archaeological resources, including attempts to modify the construction footprint to avoid impacting these sites. An archaeological work plan detailing monitoring and subsurface testing will be submitted to the Hawaii SHPO and appropriate consulting parties for review. Following an evaluation of the results of the inventory survey, the Navy would continue its Section 106 consultations with the Hawaii SHPO to obtain their concurrence on the findings and the appropriate determination of effects. Consultation with the Hawaii SHPO was initiated in a letter dated August 30, 2007. A follow-up letter detailing new project siting layouts was submitted on September 11, 2008. The Navy will continue to

consult with the Hawaii SHPO and, based on any findings, will work with the Hawaii SHPO to mitigate any potential effects. There may be inadvertent discoveries of human remains in the sandy fill material used circa 1940s in utility trenches located within the proposed project area. All construction will be conducted to minimize soil disturbance to the maximum extent practicable. It is possible that design changes could be implemented if cultural resources are identified in the project area. Should remains be discovered, the Navy will consult with the Hawaii SHPO and follow all applicable regulations. Copies of all correspondence with the Hawaii SHPO may be found in Appendix E.

### **8.13 Hazardous Materials and Waste Management**

Under all alternatives other than the No Action Alternative, operation and maintenance of the P-8A MMA would not introduce any additional hazardous materials and/or waste streams that cannot be managed by existing hazardous materials and waste management functions and facilities at MCBH Kaneohe Bay.

MCBH Kaneohe Bay has handled hazardous materials and hazardous waste associated with operation and maintenance of the P-3C aircraft since the 1990s. A review of a fiscal year (FY) 2006 hazardous waste generation report for MCBH Kaneohe Bay indicates that the types of chemicals and waste materials associated with operation and maintenance of the P-8A MMA are not substantially different from the types of chemicals and waste materials MCBH Kaneohe Bay is currently managing under its hazardous materials and hazardous waste management programs. MCBH Kaneohe Bay is currently managing hazardous materials and waste associated with operation and maintenance of the P-3C aircraft, and any facilities or functions needed to handle P-8A MMA equipment and its associated materials and waste streams are already in place.

Modifying interiors of existing facilities, including minor changes to room configuration, electrical power routing, heating, ventilation, and air conditioning (HVAC), mountings for replacement equipment, etc., would have no impact on hazardous materials use or hazardous waste generation at MCBH Kaneohe Bay. These modifications would be completed with minimal quantities, if any, of potentially hazardous materials (e.g., paint, solvents). Vehicle repair and maintenance activities at MCBH Kaneohe Bay are not projected to change with transitioning from P-3C aircraft to P-8A MMA squadrons. None of the avionics systems, engines, or aircraft components on the P-8A MMA would require using different cleaners, coolants, paints, or other

hazardous materials than those used to service the existing aircraft fleet. All wastes would continue to be collected, managed, and stored on-site in accordance with MCBH Kaneohe Bay's Hazardous Waste 90-Day Accumulation Site guidelines.

### **Installation Restoration Program (IRP) Sites**

The proposed action would have no impact on on-going remedial activities at MCBH Kaneohe Bay, and none of the proposed renovation and modification activities under any siting alternative would result in potential hazardous exposure to on-site personnel. No proposed projects would require large-scale removal or disturbance of surface soil, subsurface soil, groundwater, or existing groundcover within any IRP site. Therefore, contaminated media are not likely to be encountered near IRP site locations.

## **9 Existing Environment: NAS North Island**

### **Introduction**

North Island is located on the northern end of the Silver Strand Peninsula in San Diego County, California.

The existing environment for each relevant environmental resource is described herein to provide the public and agency decision makers with a meaningful point from which to compare potential future environmental, social, and economic effects of the proposed action and alternative actions. The environmental impacts on each resource are discussed in Chapter 10, Environmental Consequences: NAS North Island, and include a consideration of both direct and indirect effects of the proposed action (see Chapter 2, Proposed Action and Alternatives), including the No Action Alternative. Cumulative effects are described in Chapter 11.

This chapter contains a description of the environment that could be affected by the replacement of the P-3C aircraft with P-8A MMA at NAS North Island. The Council on Environmental Quality (CEQ) regulations implementing the National Environmental Policy Act (NEPA) of 1969 require that an EIS “succinctly describe the environment of the area to be affected or created by the alternatives under consideration” (40 Code of Federal Regulations [CFR] 1502.15). The descriptions of the existing environmental resources that could be affected by implementation of the proposed action and its alternatives need be no longer than necessary. Consistent with this guidance, Navy policy directs that the EIS should exclude material not directly applicable to the expected impact. Therefore, the discussion of the existing environment focuses on those resource areas where there is a potential for significant impact.

Under the replacement alternatives for NAS North Island, the existing environment may be affected by the following components of the proposed action:

- Aircraft operations; and
- Personnel relocation or transition.

Accordingly, the discussion of the existing environment in the vicinity of NAS North Island focuses on airfield operations, noise, land use, air quality, and socioeconomics. In contrast, since the number of personnel permanently stationed or employed at NAS North Island would not change under any alternative, the following existing environmental resources are not ad-

dressed in detail in this EIS because implementation of the proposed action and its alternatives would have a negligible effect or no effect on them:

- **Infrastructure and Utilities.** The negligible personnel change at NAS North Island would result in a corresponding negligible change in water use, wastewater discharge, power use, and solid waste generation and thus result in no increases in demand and no effect on the capacity of existing infrastructure and utilities.
- **Community Services.** Existing community services, including fire protection, emergency, security, and medical services would not change under any of the basing alternatives for NAS North Island or the surrounding communities because no new personnel and their families would require these services.
- **Transportation.** There would be no measurable change in the number of privately owned vehicles, traffic, and the miles traveled under all of the proposed alternatives. Thus, no additional congestion or traffic or transportation requirements on or around the base are anticipated.
- **Education.** Under all alternatives, the proposed siting of only periodic squadron detachments would not result in any permanently stationed personnel. Thus, no additional military dependents would be moving to NAS North Island or the local community and there would be no impact on education or the local school districts.
- **Topography and Soils.** The proposed action would not require any facility construction, renovation, demolition, or other ground-disturbing activities under any replacement alternative. Consequently, there would be no impacts on topography and soils.
- **Water Resources and Wetlands.** The proposed action would not require any facility construction, renovation, demolition or other ground-disturbing activities under any replacement alternative. Consequently, there would be no impacts on water resources or wetlands.
- **Vegetation.** The proposed action would not require any facility construction, renovation, demolition, or other ground-disturbing activities under any of the replacement alternatives. Consequently, there would be no impacts on vegetation.
- **Environmental Management.** The P8-MMA would operate in the same sections of the installation currently used by P-3C detachments. Moreover, because the P-8A MMA would be maintained and repaired off-site, there would be no increase in hazardous materials use.

## **9.1 Airfield Operations**

NAS North Island is headquarters to four major military flag officer staffs, including Commander Naval Air Forces, which supports 21 squadrons and more than 220 aircraft. Aircraft activities include both fixed- and rotary-wing operations, but aircraft operations are dominated by rotary-wing aircraft, including Helicopter Command Anti-Sub-, Maritime Strike-, Tactical-,



and Patrol-Wings Pacific. In addition, the air station is home to 15 anti-submarine and sea-combat helicopter squadrons, operating the H-60 aircraft. Based fixed-wing squadrons include Fleet Logistics Support Squadron 30 (VRC30) and 57 (VR57), operating the C-2A and C-40A aircraft respectively. NAS North Island has no assigned P-3C squadron; however, NAS North Island does host P-3C detachments for training at the Southern California (SOCAL) Range Complex.

The airfield at NAS North Island (Halsey Field) consists of two runways, Runway 18/36 and Runway 11/29. Runway 18/36 is 8,000 feet long and 200 feet wide. Runway 11/29 is 7,500 feet long and 300 feet wide. In addition, the airfield has 13 helicopter pads. NAS North Island also operates two other airfields in Southern California for training purposes. One is Naval Auxiliary Landing Field (NALF) San Clemente Island, located 70 miles northwest of San Diego in the California Channel Islands. The other is Naval Outlying Landing Field (NOLF) Imperial Beach, located 10 miles south of the base on the U.S.-Mexican border.

Air operations at North Island are restricted by high terrain to the northwest, civilian air operations at San Diego International Airport 3 miles to the northeast, and the city's metropolitan center 2 miles east across the bay (San Diego County Airport Draft Land Use Compatibility Plan [ALUCP] March 2005). Air Traffic Control (ATC) operates existing airspace associated with San Diego International Airport and NAS North Island as though they are serving a single airport with three dependent runways. The two airports are within 3 miles of each other and use the same terminal airspace. San Diego International Airport is located in the surface area of the San Diego Class B airspace. North Island is located in Class D airspace, the top of which touches the floor of Class B airspace at 2,800 feet above mean sea level (amsl). The primary arrival runways for these two airports converge (San Diego County Regional Airport Authority 2003).

Pilots perform approximately 104,403 flight operations (i.e., any takeoff or landing) annually at Halsey Field (Wyle Laboratories, Inc. July 2008). This number is based on projected 2012 operations at Halsey Field under representative conditions projected to occur before the P-8A MMA periodic squadron detachments are based at NAS North Island. (The Navy had previously modeled projected 2012 noise contours for NAS North Island, the projected operations year of the current AICUZ update for NAS North Island. For this analysis, these noise contours provide the best available verified data and represent the baseline conditions for NAS North Is-

land for this EIS analysis). Less than 2% (1,517) of the total annual operations occur at night. As shown on Table 9-1, under baseline conditions, airfield operations at Halsey Field would be predominantly H-60 rotary-wing aircraft operations, which would account for approximately 61% of the total airfield operations (Wyle Laboratories, Inc. July 2008). The C-12/C-26 aircraft platforms and the P-3C fixed-winged aircraft would comprise approximately 8% and 2% of total operations, respectively. Other aircraft based at the airfield include C-2, C-40, C-172, C-210, Citation 550, E-2, H-53/H-3, and Lear 24/35/36 aircraft; transient aircraft make up the remaining operations. Arrival and departure flight tracks at NAS North Island are shown on Figure 9-1.

**Table 9-1 Modeled Baseline Annual Operations at NAS North Island (2012)**

<b>Airfield Operations</b>				
	<b>7:00 a.m. to 7:00 p.m.</b>	<b>7:00 a.m. to 10:00 p.m.</b>	<b>10:00 p.m. to 7:00 a.m.</b>	<b>Total</b>
<b>P-3C<sup>1</sup></b>				
Departure	928	36	19	983
Arrival	928	37	18	983
Overhead Break Arrival	0	0	0	0
Touch-and-Go	0	0	0	0
GCA Pattern	33	13	39	85
<b>Total</b>	<b>1,889</b>	<b>86</b>	<b>76</b>	<b>2,051</b>
<b>H-60</b>				
Departure	24,071	3,184	376	27,631
Arrival	23,170	3,819	642	27,631
Overhead Break Arrival	0	0	0	0
Touch-and-Go	0	0	0	0
GCA Pattern	7,869	721	88	8,678
<b>Total</b>	<b>55,110</b>	<b>7,724</b>	<b>1,106</b>	<b>63,940</b>
<b>C-12 (C-12/C-26)</b>				
Departure	3,776	177	47	4,000
Arrival	3,843	118	39	4,000
Overhead Break Arrival	0	0	0	0
Touch-and-Go	206	0	0	206
GCA Pattern	162	16	1	179
<b>Total</b>	<b>7,987</b>	<b>311</b>	<b>87</b>	<b>8,385</b>
<b>Other Aircraft<sup>2</sup></b>				
Departure	9,951	212	28	10,191
Arrival	9,822	193	49	10,064
Overhead Break Arrival	113	15	0	128
Touch-and-Go	720	9	0	729
GCA Pattern	2,582	149	36	2,767
<b>Total</b>	<b>23,188</b>	<b>578</b>	<b>113</b>	<b>23,879</b>

**Table 9-1 Modeled Baseline Annual Operations at NAS North Island (2012) (continued)**

	Airfield Operations			
	7:00 a.m. to 7:00 p.m.	7:00 a.m. to 10:00 p.m.	10:00 p.m. to 7:00 a.m.	Total
Transient Aircraft <sup>3</sup>				
Departure	2,793	78	60	2,931
Arrival	2,483	70	54	2,607
Overhead Break Arrival	315	9	0	324
Touch-and-Go	39	0	0	39
GCA Pattern	185	41	21	247
Total	5,815	198	135	6,148
Summary – All Aircraft				
Departure	41,519	3,687	530	45,736
Arrival	40,246	4,237	802	45,285
Overhead Break Arrival	428	24	0	452
Touch-and-Go	965	9	0	974
GCA Pattern	10,831	940	185	11,956
Total	93,989	8,897	1,517	104,403

Source: Wyle Laboratories, Inc. July 2008.

## Notes:

<sup>1</sup> P-3C aircraft are shown separately from transient aircraft for clarity.<sup>2</sup> Includes C-2, C-40, C-172, C-210, Citation 550, E-2, H-53/H-3, and Lear 24/35/36 aircraft.<sup>3</sup> Includes AV-8B, C-5, C-17, C-130H, E/A-18G, F/A-18C/D, and F/A-18E/F.

## Key:

GCA = Ground control approach.

## 9.2 Noise

Aircraft operations, including flight operations and ground engine-maintenance run-ups, are the primary source of noise at NAS North Island. Flight operations at NAS North Island are dominated by rotary aircraft operations (H-60 and some H-53) (see Table 9-1). However, the effect of these operations on the noise environment at NAS North Island is relatively small. EA-18G, F/A-18, and C-5 aircraft operations contribute approximately 68% of the acoustic energy to the noise environment at NAS North Island (Wyle Laboratories, Inc. July 2008). Other flight operations include various permanent and transient fixed-wing arrivals, departures, and patterns (C-12, C-172, Lear 24/35/36, and others).

A major tenant activity at NAS North Island is the Naval Aviation Depot (NADEP). NADEP North Island conducts depot maintenance, major modifications, and crash-damage repair for aircraft throughout the fleet, including the CH-53, C-2, E-2, EA-6, F/A-18, SH-60, and other aircraft. Part of the maintenance includes in-frame and out-of-frame engine maintenance

run-ups used to test the engine at various power settings and durations. In-frame and out-of-frame engine maintenance run-ups are conducted at several locations at NAS North Island. Pre-flight engine run-ups are generally not conducted for the types of aircraft stationed at NAS North Island. Noise exposure is typically calculated using the day-night average sound level (DNL) or the community noise equivalent level (CNEL) in the state of California. The DNL/CNEL noise metric is based on the number of operations occurring on an average annual day or average busy day over a 24-hour period. The DNL/CNEL metric includes a 10 decibel (dB) penalty for nighttime operations (10:00 p.m. to 7:00 a.m.) because people are more sensitive to noise during normal sleeping hours, when ambient noise levels are lower. The CNEL also includes a 5-dB penalty for evening operations (7:00 p.m. to 10:00 p.m.). The DNL/CNEL has been determined to be a reliable measure of community annoyance with aircraft noise and has become the standard metric used by many federal and state governmental agencies and organizations in the United States, such as the U.S. Environmental Protection Agency (EPA) and the Federal Aviation Administration (FAA), for assessing aircraft noise.

The DNL/CNEL for the community is depicted as a series of contours connecting points of equal value, usually in 5-dB increments. Calculated noise contours do not represent exact scientific measurements. The area between two specific contours is known as a noise zone. The noise zones for NAS North Island used in this study are:

- Less than 65 dB CNEL;
- 65 to < 70 dB CNEL;
- 70 to < 75 dB CNEL; and
- Greater than 75 dB CNEL.

Individual response to noise levels varies and is influenced by many factors, including:

- The activity the individual is engaged in at the time of the noise;
- General sensitivity to noise;
- Time of day;
- Length of time an individual is exposed to a noise;
- Predictability of noise; and
- Average temperature.

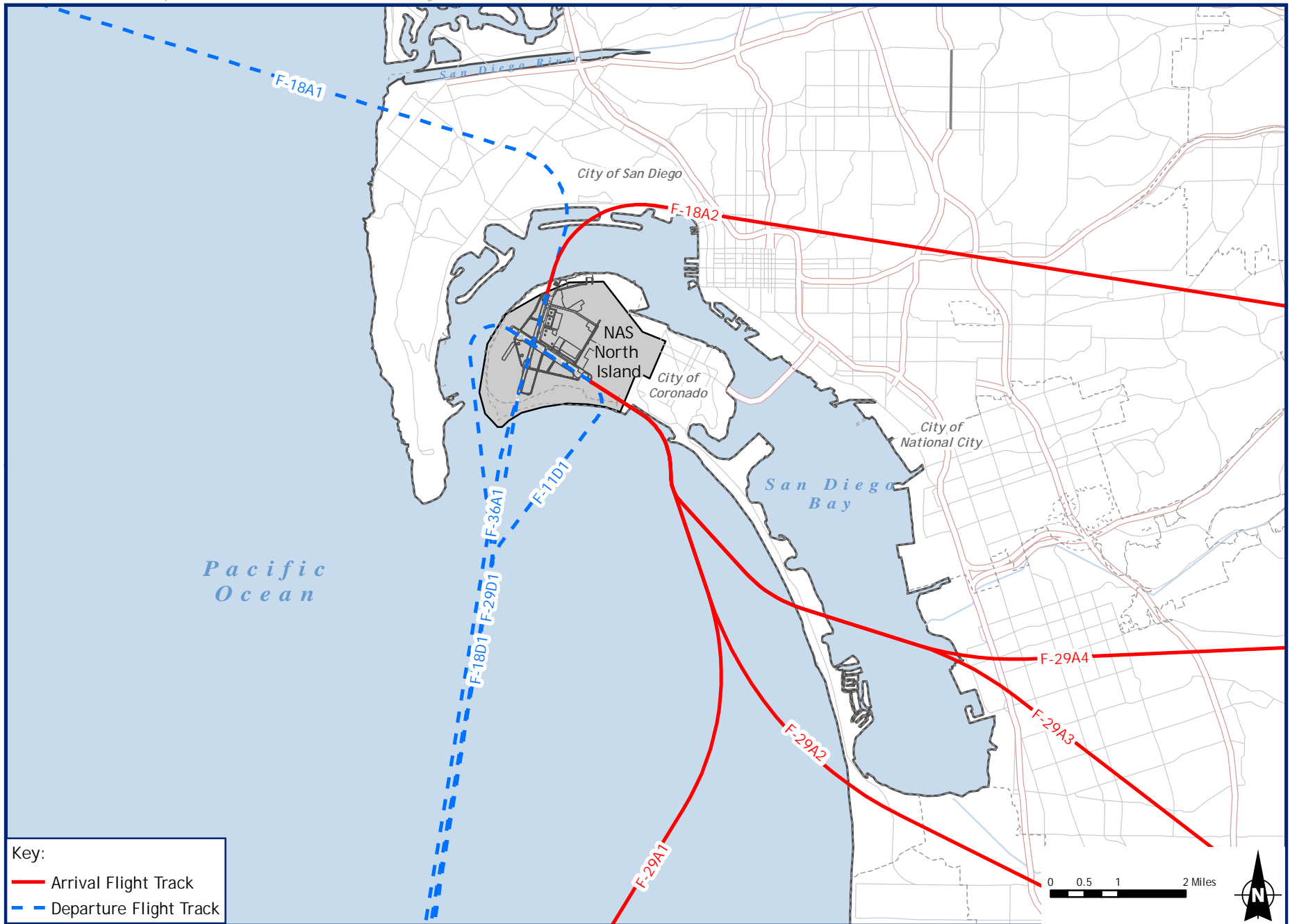


Figure 9-1  
P-3C Flight Tracks at  
NAS North Island, California

A small change in dBA (A-weighted decibels) would not generally be noticeable. As the change in dBA increases, individual perception is greater, as shown in Table 9-2.

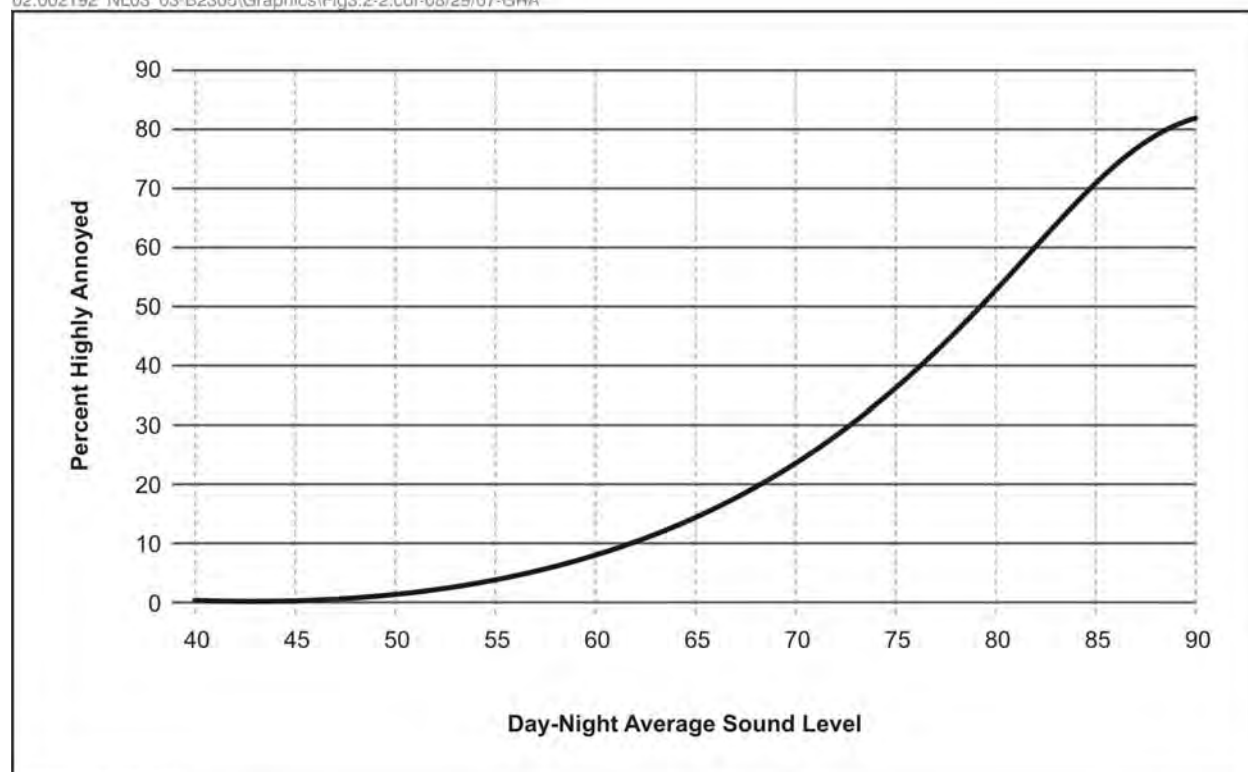
**Table 9-2 Subjective Responses to Changes in A-Weighted Decibels**

Change	Change in Perceived Loudness
1 dB	Requires close attention to notice
3 dB	Barely perceptible
5 dB	Quite noticeable
10 dB	Dramatic-twice or half as loud
20 dB	Striking – fourfold change

Source: Wyle Laboratories, Inc. October 2004.

However, on a group or community level, various studies and surveys have shown a correlation between the DNL and the percentage of people who consider themselves “highly annoyed.” This correlation is shown on Figure 9-2. This curve, which was originally developed in the 1970s and has been updated over the last 10 years, remains the best available method to estimate community response to aircraft noise.

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Source: Schultz 1978

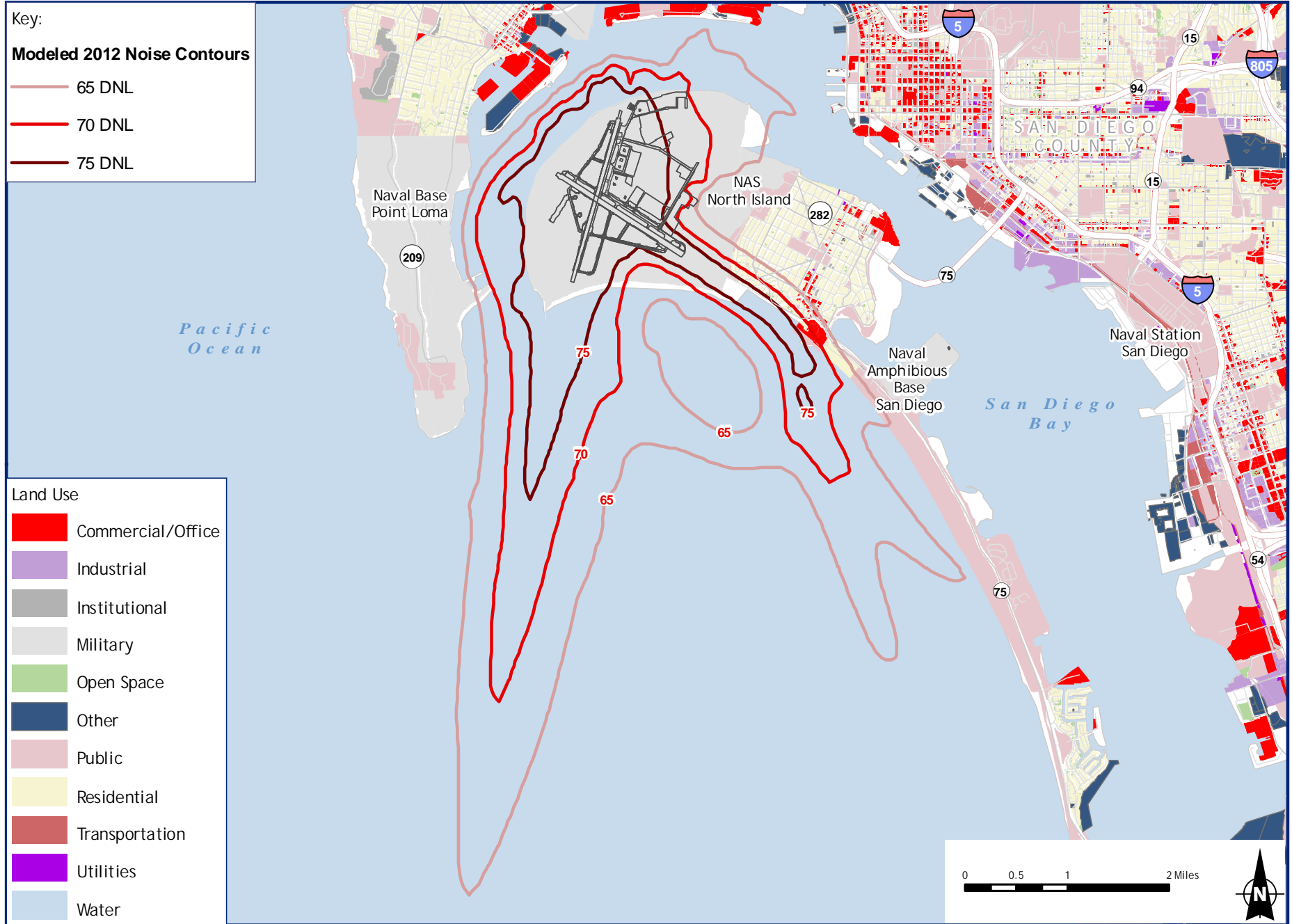
**Figure 9-2 Influence of Sound Level on Annoyance**

The sound exposure level (SEL) is a composite metric representing both the intensity of a sound and its duration. Individual time-varying noise events (e.g., aircraft overflights) have two main characteristics: a sound level that changes throughout the event and a period of time during which the event is heard. The SEL provides a measure of the net impact of the entire acoustic event, but it does not directly represent the sound level heard at any given time. During an aircraft flyover, the SEL would include both the maximum noise level and the lower noise levels produced during onset and recess periods of the overflight.

The SEL is a logarithmic measure of the total acoustic energy transmitted to the listener during the event. Mathematically, it represents the sound level of a constant sound that would, in one second, generate the same acoustic energy as the actual time-varying noise event. For sound from aircraft overflights, which typically lasts more than one second, the SEL is usually greater than the maximum sound level ( $L_{\max}$ ) because an individual overflight takes seconds and the  $L_{\max}$  occurs instantaneously. The SEL represents the best metric to compare noise levels from overflights (Wyle Laboratories, Inc. July 2008).

As shown in Table 9-3 and Figure 9-3, the noise zones for NAS North Island primarily extend over the installation and water surrounding the installation. However, to the east, the noise zones extend over a densely residential area along the shoreline within the city of Coronado, so although the noise zones encompass less than 1 square mile off-station, they encompass approximately 1,700 housing units and a population of approximately 2,000 persons.

The noise contours representing the baseline environment for NAS North Island (Figure 9-3) were developed using estimated average annual airfield operations as shown in Table 9-1 and average annual engine maintenance run-ups (Wyle Laboratories, Inc. July 2008). The off-station area and the estimated 2000 census population within the modeled baseline noise zones are shown in Table 9-3. The population shown is a proportion of the census block based on the geographic area of the noise zone. Although the 2000 census data is used in this analysis, no adjustments to the 2000 population data have been made because 1) the population of the city of Coronado affected by the noise contours has remained stable between 1990 and 2000 and is projected to remain stable through 2012, and 2) residential areas are built out around NAS North Island and the city of Coronado's actual population has remained relatively constant. Therefore, no growth factors have been applied to the baseline conditions at NAS North Island.





**Table 9-3 Off-Station Area and Estimated Population within Baseline 2012  
Noise Zones for NAS North Island**

Noise Zone (CNEL)	Area (Acres)	Area (Square Miles)	Population
65 to < 70 dB	140	0.22	1,600
70 to < 75 dB	63	0.10	364
75 dB or greater	20	0.03	62
<b>Total</b>	<b>223</b>	<b>0.35</b>	<b>2,026</b>

Source: Wyle Laboratories, Inc. July 2008.

Notes:

<sup>1</sup> The area within the 65 dB DNL or greater noise zone does not include the area within the boundary of NAS North Island or the portion of the noise zone that extends over San Diego Bay and the Pacific Ocean.

<sup>2</sup> Census data are reported by blocks. The population shown is a proportion of the census block based on the geographic area of the noise zone. These data should be used for comparative purposes only and are not considered actual numbers within the noise zones.

Key:

CNEL = Community Noise Equivalent Level.

dB = Decibel.

A discussion of the compatibility of land uses within the noise zones is included in Section 9.3.4 below.

## **9.3 Land Use**

### **9.3.1 NAS North Island Land Use**

NAS North Island occupies approximately 2,800 acres on the northern end of the Silver Strand Peninsula in San Diego County, California. The station is bordered on the east by the city of Coronado, by San Diego Bay to the north and west, and by the Pacific Ocean to the south. Most of NAS North Island has been developed and much of the remaining vegetated areas are restricted to the southern edge of the station.

The central portion of NAS North Island is dominated by the airfield, which includes a 7,500-foot runway (Runway 11/29) and an 8,000-foot runway (Runway 18/36). Airfield operations areas are located east and west of the runways and include aircraft parking ramps, aircraft maintenance hangars, taxiways, and various other support facilities. Supply, administration, and command and control facilities are dispersed throughout NAS North Island. Residential quarters are located east of the airfield and north of the main administrative area, while bachelor quarters are located near the main gate. Recreational land uses are in the southeast portion of the base and a beach is along the station's southern shoreline (Naval Facilities Engineering Command Southwest Division 2002).

A fence extends along the station's eastern border, where station property meets the city of Coronado. Access to the station is restricted to military and civilian personnel and authorized visitors (Naval Facilities Engineering Command Southwest Division 2002).

### **9.3.2 Regional Land Use**

Portions of NAS North Island are located within the incorporated boundaries of the city of Coronado and the city of San Diego. The city of Coronado lies adjacent to the installation. Downtown San Diego is approximately 2 miles northeast of the installation.

Predominant land uses in the vicinity of NAS North Island include:

- Dense single-family residential development along the station's eastern boundary. Farther east, in the central portion of the city of Coronado, is a dense mixture of multiple-family residences, commercial/business facilities, civic facilities, small parks, and resorts and hotels. Coronado's shoreline mainly consists of residential development, recreational areas, and parks.
- Public, private, and military marinas along San Diego Bay's shorelines. Other coastal land uses in San Diego Bay include industrial, commercial, residential, and resort properties.
- The U.S. Naval Reservation east of NAS North Island and north of the station in San Diego.
- Naval Submarine Base Point Loma, west of NAS North Island in San Diego.
- Fleet Anti-submarine Warfare Training Center, north of NAS North Island.
- San Diego International Airport (Lindberg Field) northeast of the station.
- Fort Rosecrans Military Reservation and Cabrillo National Monument west of the station on Point Loma.

### **9.3.3 Land Use Controls**

Development within and around NAS North Island is controlled, guided, or influenced by the following plans, programs, and policies:

- The Navy and Marine Corps Air Installations Compatible Use Zones (AICUZ) Program;
- The 2002 Naval Base Coronado Integrated Natural Resource Management Plan (INRMP);
- City of Coronado General Plan;
- California Coastal Management Program (CCMP).

## **AICUZ Program**

The AICUZ Program was established in the 1970s by the Department of Defense (DoD) to analyze operational training requirements and to address communities' concerns about aircraft noise and accident potential. The purpose of the AICUZ Program is to achieve compatibility between air installations and neighboring communities by:

- Protecting the health, safety, and welfare of civilians and military personnel by encouraging land use that is compatible with aircraft operations;
- Protecting Navy and Marine Corps installation investment by safeguarding the installation's operational capabilities;
- Reducing noise impacts caused by aircraft operations while meeting operational, training, and flight safety requirements; and
- Informing the public about the AICUZ Program and seeking cooperative efforts to minimize noise and potential aircraft accident impacts.

An AICUZ study analyzes aircraft noise, accident potential, land-use compatibility, and operational procedures and provides recommendations for compatible development near air installations. Federal, state, regional, and local governments are encouraged to adopt guidelines promoting compatible development. The AICUZ Program defines the noise zones and accident potential zones (APZs) that represent the area where land-use controls are needed to protect the health, safety, and welfare of those living near the installation and to preserve the military flying mission.

**Noise.** Under the AICUZ Program, noise zones are identified as the area between the calculated noise contours, based on the number of operations that occur on an average annual day or average busy day (see Section 9.2 above). For land-use planning purposes, the noise zones are grouped into three noise zones. Noise Zone 1 (less than 65 dB CNEL) is generally considered an area of low or no noise impact. Noise Zone 2 (65 to 75 dB CNEL) is an area of increased impact where some land-use controls are required. Noise Zone 3 (greater-than-75 dB CNEL) is the highest impacted area and requires the greatest degree of land-use control.

**APZs.** The number and type of airfield operations are also used as the basis for identifying APZs around an airfield. Although the likelihood of an aircraft mishap occurring is remote, the Navy identifies areas of accident potential to assist in land-use planning. APZs are areas where an aircraft mishap is most likely to occur and is delineated based on historical data and

departure, arrival, and pattern flight tracks on and near the airfield runways. The Navy recommends that local planning agencies plan for and construct developments that concentrate large numbers of people, such as apartments, churches, and schools, outside the APZs.

APZs include three restricted areas, with areas nearest the runways having the most restrictions. These areas, the Clear Zone, APZ 1, and APZ 2, are configured as follows:

- **Clear Zone.** The Clear Zone extends 3,000 feet beyond the end of the runway; it measures 1,500 feet wide at the end of the runway and 2,284 feet wide at its outer edge.
- **APZ 1.** APZ 1 extends 5,000 feet beyond the Clear Zone, with a width of 3,000 feet at its outer edge. APZ 1 is typically rectangular, although it may curve to conform to the predominant flight track.
- **APZ 2.** APZ 2 extends 7,000 feet beyond APZ 1, with a width of 3,000 feet. This zone is typically rectangular, although it too may conform to the curve of the predominant flight track.

At NAS North Island, all clear zones and APZs are located on-station or offshore in the Pacific Ocean or San Diego Bay.

Although ultimate control over land use and development in the vicinity of military facilities is the responsibility of local governments, the Navy recommends, through its AICUZ Program, that localities adopt programs, policies, and regulations to promote compatible development, where appropriate and feasible, near Naval and Marine Corps air installations. Such land-use recommendations by the Navy are intended to serve as guidelines; they are based on the assumption that noise-sensitive uses (e.g., houses, churches, hospitals, amphitheaters, etc.) should be located outside high-noise zones and that people-intensive uses should not be located in APZs. The purpose of the Navy's land-use recommendations is not to preclude productive use of land around Naval and Marine Corps air installations but to recommend best uses of the land that are protective of human health, safety, and welfare. The Navy's recommendations can be implemented by ensuring development restrictions are placed on noise-sensitive uses in high-noise zones and on people-intensive uses in APZs as well as fair disclosure in real estate transactions and the use of sound-attenuating construction.

The AICUZ Program for NAS North Island was first established by the Navy in 1979. The station's AICUZ was updated in 1984 and is currently being updated.

### **Integrated Natural Resources Management Plan (INRMP)**

An INRMP was prepared for Naval Base Coronado, which includes NAS North Island, in May 2002. This plan replaces and combines other natural resource management plans for components of the Naval Base Coronado Complex. Three main goals of the 2002 INRMP are (1) to guarantee full and complete implementation of Naval Base Coronado's military mission while preserving, protecting, and enhancing natural ecosystems and biodiversity; (2) to manage the installation so there is no net loss to the operational carrying capacity of the Naval base properties and to accommodate increased military mission requirements while minimizing environmental impacts and meeting all federally mandated environmental compliance responsibilities; and (3) to provide organizational capacity, support, and communication lines necessary to effective planning and daily administration of the plan. As such, the updated INRMP fulfills requirements of the Sikes Act and other pertinent laws (e.g., the Endangered Species Act [ESA]) and military directives.

The Naval Base Coronado Environmental/Natural Resources Department is responsible for the programmatic oversight, management, and supervision of natural resource management at the air station.

### **City of Coronado General Plan and Zoning Ordinance**

California planning and zoning law requires both cities and counties to prepare and adopt a comprehensive, long-range general plan to serve as a guide in land-use decisions. The Coronado General Plan includes 17 elements to guide future land use within the city. The plan does not include any development restrictions related to military facilities but does encourage establishing compatible land uses and the overall maintenance and residential character of the city.

Zoning is the primary land-use control used by the city of Coronado to control development on non-federal property. The majority of lands adjacent to the station are zoned for residential uses. The zoning ordinance does not restrict development on lands within the noise zones of NAS North Island.

### **California Coastal Management Program (CCMP)**

The Coastal Zone Management Act (CZMA) of 1972 encourages states to develop management plans for coastal zones in order to protect natural resources and shoreline-related com-

mercial land uses of the nation's shorelines. Section 307 of the CZMA stipulates that where a federal project initiates reasonably foreseeable effects on any coastal use or resource (land or water use or natural resources), the action must be consistent to the "maximum extent practicable with the enforceable policies of approved State management programs" (16 U.S. Code [U.S.C.] 1456 (c)(1)(A)).

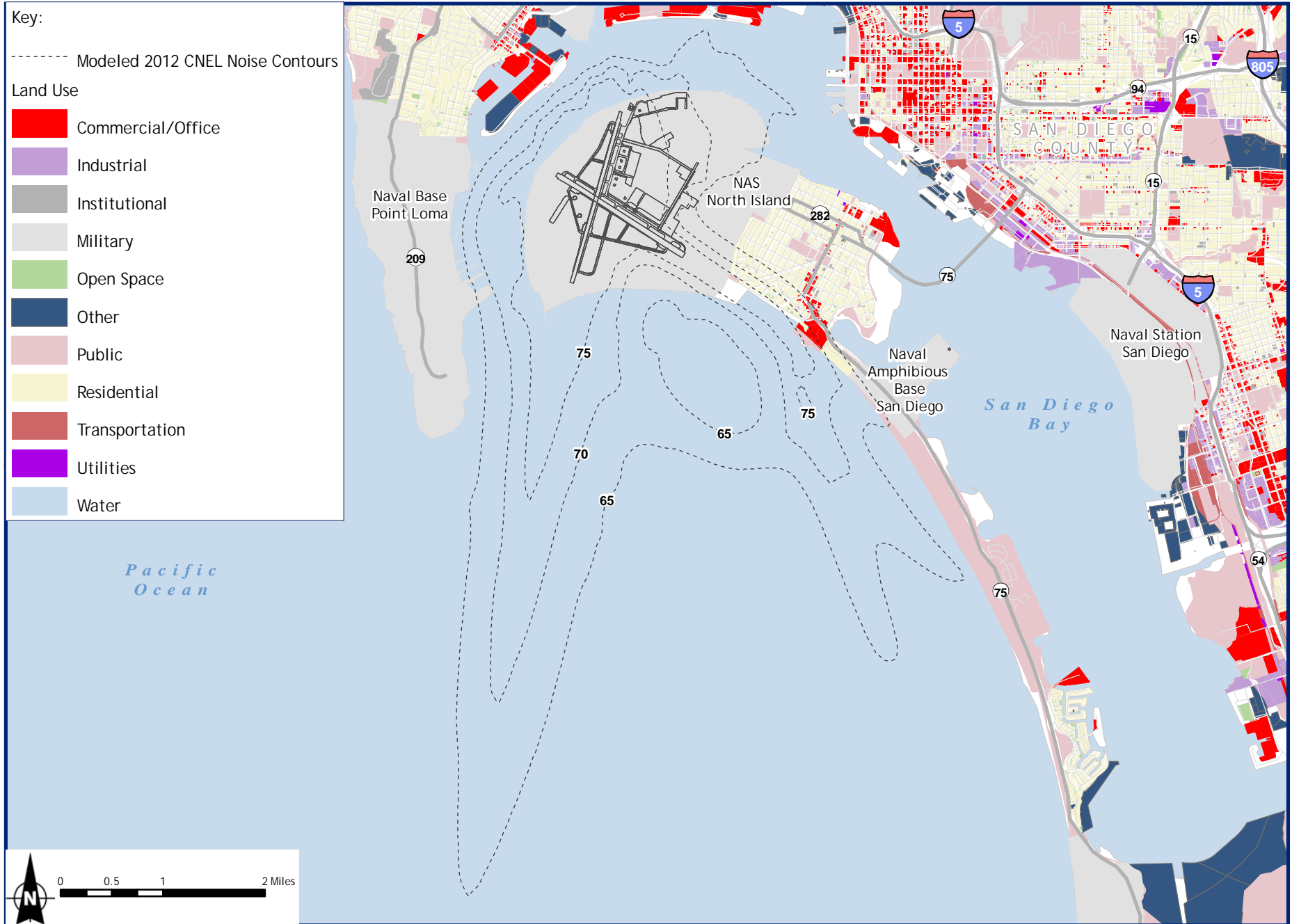
California's coastal zone management program was approved by the federal government in 1978. The California Coastal Act was most recently updated in 2007 and is implemented by the California Coastal Commission. Under the act, activities impacting any land use, water use, or natural resource of the coastal zone must be consistent with the following six enforceable policies: Public Access; Recreation; Marine Environment; Land Resources; Development; and Industrial Development.

Federal lands such as NAS North Island, which are "lands the use of which is by law subject solely to the discretion of the Federal Government, its officers, or agency," are statutorily excluded from the CZMA's definition of "coastal zone" (16 [U.S.C.] Section 1453(1)). If, however, the proposed federal activity impacts coastal resources or uses beyond the boundaries of the federal property (i.e., has spillover effects), the CZMA Section 307 federal consistency requirement applies.

#### **9.3.4 Land-Use Compatibility Assessment**

To determine the compatibility of land uses with existing aircraft operations at NAS North Island, the 2012 baseline noise contour map was overlaid on the San Diego County land-use map. As previously noted, the 2012 baseline noise contours are representative of conditions at NAS North Island prior to the introduction of the P-8A MMA. Land-use designations within the 2012 baseline noise zones were compared with the Navy/Marine Corps land-use compatibility recommendations under its AICUZ Program (see Appendix G).

Table 9-4 provides the total area, by land-use category, within the 65 to 70 dB CNEL, 70 to 75 dB CNEL, and greater-than-75 dB CNEL noise zones around NAS North Island. All land-use categories in the less-than-65 dB CNEL noise zone are considered to be compatible, according to the AICUZ guidelines (see Figure 9-4).



**Table 9-4 Existing Land Uses within Noise Zones at NAS North Island**

Land Use	Noise Zone (acres)			Total Acres (% of Total Land Use)
	65 to 70 dB CNEL	70 to 75 dB CNEL	>75dB CNEL	
Residential	79	35	3	117 (1)
Commercial/Office	23	10	0	33 (<1)
Institutional	1	0	0	1 (<1)
Recreation/Open Space	75	22	34	131 (1)
Transportation/Utilities	47	21	12	80 (1)
Military	401	410	1,440	2,251 (22)
Water	4,646	1,965	841	7,452 (74)
<b>Total</b>	<b>5,272</b>	<b>2,463</b>	<b>2,330</b>	<b>10,065</b>

## **9.4 Air Quality NAS North Island**

### **9.4.1 Air Quality Regulations**

The Clean Air Act (CAA) is the primary federal statute governing control of air quality. The CAA designates six pollutants as “criteria pollutants” for which National Ambient Air Quality Standards (NAAQS) have been established to protect public health and welfare. These include particulate matter less than 10 microns in diameter (PM<sub>10</sub>), carbon monoxide (CO), sulfur dioxide (SO<sub>2</sub>), nitrogen dioxide (NO<sub>2</sub>), lead (Pb), and ozone O<sub>3</sub>). Areas that do not meet NAAQS for criteria pollutants are designated “nonattainment areas” for that pollutant. Areas achieving the air quality standard after being designated nonattainment are redesignated as attainment following EPA approval of a maintenance plan. Under the CAA, state and local agencies may establish ambient air quality standards (AAQS) and regulations of their own, provided these are at least as stringent as the federal requirements. Table 9-5 summarizes federal and state AAQS.

NAS North Island is located within the San Diego air basin (SDAB) and is contiguous with the borders of San Diego County. The San Diego air basin currently meets federal and state standards for all criteria pollutants, except ozone. The SDAB is presently in “basic” nonattainment for the 8-hour ozone standard (whose precursor emissions are volatile organic compounds [VOCs] and nitrogen oxides [NO<sub>x</sub>]) (U.S. Environmental Protection Agency 2007). The SDAB is also a maintenance area for the CO standard (former nonattainment areas that have attained the NAAQS).



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**Table 9-5 National and California State Ambient Air Quality Standards**

Pollutant	Averaging Time	NAAQS <sup>1</sup>		CAAQS <sup>2</sup> Concentration <sup>5</sup>
		Primary <sup>3</sup>	Secondary <sup>4</sup>	
Ozone (O <sub>3</sub> ) <sup>6</sup>	1-Hour	0.12 parts per million (ppm) (235 micrograms per cubic meter [µg/m <sup>3</sup> ])	Same as Primary Standard	0.09 ppm (180 µg/m <sup>3</sup> )
	8-Hour	0.08 ppm		0.070 ppm
Carbon Monoxide (CO)	8-Hour	9.0 ppm (10 µg/m <sup>3</sup> )	None	9.0 ppm (10 µg/m <sup>3</sup> )
	1-Hour	35 ppm (40 µg/m <sup>3</sup> )		20 ppm (23 µg/m <sup>3</sup> )
Nitrogen Dioxide (NO <sub>2</sub> )	Annual Average	0.053 ppm (100 µg/m <sup>3</sup> )	Same as Primary Standard	-
	1-Hour	-		0.25 ppm (470 µg/m <sup>3</sup> )
Sulfur Dioxide (SO <sub>2</sub> )	Annual Average	0.03 ppm (80 µg/m <sup>3</sup> )	-	-
	24-Hour	0.14 ppm (365 µg/m <sup>3</sup> )	-	0.04 ppm (105 µg/m <sup>3</sup> )
	3-Hour	-	0.5 ppm (1300 µg/m <sup>3</sup> )	-
	1-Hour	-	-	0.25 ppm (655 µg/m <sup>3</sup> )
Suspended Particulate Matter (PM <sub>10</sub> )	24-Hour	150 µg/m <sup>3</sup>	Same as Primary Standard	50 µg/m <sup>3</sup>
	Annual Arithmetic Mean	50 µg/m <sup>3</sup>		20 µg/m <sup>3</sup> (see note 7)
Fine Particulate Matter (PM <sub>2.5</sub> ) <sup>6</sup>	24-Hour	65 µg/m <sup>3</sup>	Same as Primary Standard	-
	Annual Arithmetic Mean	15 µg/m <sup>3</sup>		12 µg/m <sup>3</sup> (see note 7)
Lead (Pb) <sup>8</sup>	30-Day Average	-	-	1.5 µg/m <sup>3</sup>
	Calendar Quarter	1.5 µg/m <sup>3</sup>	Same as Primary Standard	-
Hydrogen Sulfide (HS)	1-Hour	No Federal Standards		0.03 ppm (42 µg/m <sup>3</sup> )
Sulfates (SO <sub>4</sub> )	24-Hour			25 µg/m <sup>3</sup>
Visibility-Reducing Particles	8-Hour (10 a.m. to 6 p.m. Pacific Standard Time)			Insufficient amount to produce an extinction coefficient of 0.23 per kilometer due to particles when the relative humidity is less than 70%
Vinyl chloride <sup>8</sup>	24-Hour			0.01 ppm (26 µg/m <sup>3</sup> )

Source: California Air Resources Board 2005; U.S. Environmental Protection Agency 2007.

Notes:

- <sup>1</sup> NAAQS (other than O<sub>3</sub>, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The O<sub>3</sub> standard is attained when the fourth highest 8-hour concentration in a year, averaged over three years, is equal to or less than the standard. For PM<sub>10</sub>, the 24-hour standard is attained when 99% of the daily concentrations, averaged over three years, are equal to or less than the standard. For PM<sub>2.5</sub>, the 24-hour standard is attained when 98% of the daily concentrations, averaged over three years, are equal to or less than the standard. Contact the EPA for further clarification and current federal policies.
- <sup>2</sup> California Ambient Air Quality Standards (CAAQS) for O<sub>3</sub>, CO (except Lake Tahoe), SO<sub>2</sub> (1- and 24-hour), NO<sub>2</sub>, PM<sub>10</sub>, and visibility-reducing particles, are values that are not to be exceeded. All others are not to be equaled or exceeded.
- <sup>3</sup> National Primary Standards: The levels of air quality necessary, with an adequate margin of safety, to protect the public health.
- <sup>4</sup> National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.
- <sup>5</sup> Concentration expressed first in units in which it was promulgated. In this table "ppm" refers to ppm by volume or micromoles of pollutant per mole of gas.
- <sup>6</sup> New federal 8-hour ozone and fine particulate matter standards were promulgated by the EPA on 18 July 1997. The federal 1-hour O<sub>3</sub> standard continues to apply in areas that violated the standard. On 15 April 2004 the EPA issued attainment designations for the 8-hour standard and described plans for the phase out of the 1-hour standard (U.S. Environmental Protection Agency 2004a).
- <sup>7</sup> On 5 June 2003, the Office of Administrative Law approved the amendments to the regulations for the state ambient air quality standards for particulate matter and sulfates. Those amendments established a new annual average standard for PM<sub>2.5</sub> of 12 µg/m<sup>3</sup> and reduced the level of the annual average standard for PM<sub>10</sub> to 20 µg/m<sup>3</sup>. The approved amendments were filed with the Secretary of State on 5 June 2003. The regulations became effective on 5 July 2003.
- <sup>8</sup> The California Air Resources Board (CARB) has identified lead and vinyl chloride as "toxic air contaminants with no threshold level of exposure for adverse health effects determined." These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

In San Diego County, the San Diego Air Pollution Control District (SDAPCD) is the agency responsible for protecting public health and welfare through administration of federal and state air quality laws and policies. Included in SDAPCD's tasks are monitoring air pollution, preparation of the San Diego County portion of the State Implementation Plan (SIP), and promulgation of rules and regulations. The SIP includes strategies and tactics to be used to attain and maintain acceptable air quality in the county. This list of strategies is called the Regional Air Quality Strategies. The rules and regulations include procedures and requirements to control emission of pollutants and to prevent significant adverse impacts.

The 1990 amendments to CAA Section 176 require the EPA to promulgate rules to ensure federal actions conform to the appropriate SIP. These rules, known together as the General Conformity Rule (40 CFR §§ 51.850-860 and 40 CFR §§ 93.150-160), require any federal agency responsible for an action in a nonattainment area to determine the action conforms to the applicable SIP or that the action is exempt from the General Conformity Rule requirements. This means that federally supported or funded activities would not (1) cause or contribute to any new air quality standard violation, (2) increase the frequency or severity of any existing standard violation, or (3) delay timely attainment of any standard, interim emission reduction, or other milestone. Actions would conform to a SIP and be exempt from a conformity determination if an applicability analysis shows that the total direct and indirect emissions from the project construction and change in operation activities would be less than specified emission rate thresholds, known as *de minimis* limits (see Table 9-6), and the emissions would be less than 10% of the area emission budget. The annual conformity *de minimis* thresholds for SDAB, therefore, are 100 tons per year (tpy) of VOCs, NO<sub>x</sub>, and CO.

#### **9.4.2 Existing Emissions**

Ambient air quality in the San Diego area has improved significantly since the early 1990s but continues to exceed federal and state standards for ozone. Most emissions in San Diego County are attributed to vehicle emissions. Table 9-7 provides recent monitoring data from the area near NAS North Island.

**Table 9-6 De Minimis Levels for Exemption from General Conformity Rule Requirements**

Pollutant	Tons/Year
<b>Ozone (VOCs or NO<sub>x</sub>)</b>	
Serious nonattainment areas	50
Severe nonattainment areas	25
Extreme nonattainment areas	10
Marginal and moderate ozone nonattainment and ozone maintenance areas outside an ozone transport region	
VOCs	100
NO <sub>x</sub>	100
Marginal and moderate nonattainment and ozone maintenance areas inside an ozone transport region	
VOCs	50
NO <sub>x</sub>	100
<b>CO</b>	
All nonattainment and maintenance areas	100
<b>SO<sub>2</sub> or NO<sub>2</sub></b>	
All nonattainment and maintenance areas	100
<b>Particulate Matter (PM<sub>10</sub>)</b>	
Moderate nonattainment and maintenance areas	100
Serious nonattainment areas	70
<b>Lead</b>	
All nonattainment and maintenance areas	25

Source: 40 CFR 51.

Sources of air pollutants at NAS North Island include mobile emissions from aircraft, ground service equipment and vehicles, and private and government vehicles. Stationary source emissions are from external combustion equipment, internal combustion engines, surface-coating operations, solvent use, fuel storage tanks, and other miscellaneous operations. Stationary sources are operated under a site-wide Title V permit. No P-3C squadrons currently are based at NAS North Island. However, existing emissions from transient P-3C aircraft operations would be affected by this action, and therefore these emissions have been calculated for the installation. Emissions also result from the operation of personally owned vehicles (POVs) used by station personnel to commute to work. Emissions from the vehicles of personnel associated with this action have been calculated (see Table 9-8). Emissions calculations are described in detail in Appendix H.

**Table 9-7 Ambient Air Quality Measurements, San Diego, California**

Pollutant	Averaging Time	Federal Primary Standards	California Air Quality Standards	Maximum Concentrations <sup>1</sup>			Number of Days Exceeding Federal Standard <sup>2</sup>			Number of Days Exceeding State Standard <sup>2</sup>		
				2005	2006	2007	2005	2006	2007	2005	2006	2007
Ozone <sup>3</sup>	1 hour	0.12 ppm	0.09 ppm	0.069	0.07	0.061	0	0	0	0	0	0
	8 hours	0.08 ppm	None	0.056	0.061	0.053	0	0	0	NA	NA	NA
Carbon Monoxide <sup>4</sup>	1 hour	35 ppm	20 ppm	5	6.6	4.9	0	0	0	0	0	0
	8 hours	9 ppm	9 ppm	3.6	3.3	3.7	0	0	0	0	0	0
Nitrogen Dioxide <sup>3</sup>	1 hour	None	0.25 ppm	0.087	0.089	0.083	0	0	0	0	0	0
	Annual	0.053 ppm	None	0.023	0.021	0.026	0	0	0	0	0	0
PM <sub>10</sub> <sup>4</sup>	24 hours	150 µg/m <sup>3</sup>	50 µg/m <sup>3</sup>	54	57	35	0	0	0	1	1	0
	Annual	50 µg/m <sup>3</sup>	30 µg/m <sup>3</sup>	37	34	28	NA	NA	NA	0	0	0
PM <sub>2.5</sub> <sup>4</sup>	24 hours	65 µg/m <sup>3</sup>	None	34	28	35	0	0	0	0	0	0
	Annual	15 µg/m <sup>3</sup>	12 µg/m <sup>3</sup>	15.6	13.1	12.5	1	0	0	1	1	1

Source: U.S. Environmental Protection Agency 2007 <http://www.epa.gov/air/data/geosel.html>.

Notes:

<sup>1</sup> Concentration units for O<sub>3</sub>, CO, and NO<sub>2</sub> are in parts per million (ppm). Concentration units for PM<sub>10</sub> are in micrograms per cubic meter (µg/m<sup>3</sup>).

<sup>2</sup> For annual standards, a value of 1 indicates that the standard has been exceeded.

<sup>3</sup> Ozone, nitrogen dioxide, and particulate data from monitor at 1110 Beardsley Street, San Diego, CA.

<sup>4</sup> Carbon monoxide data from CO monitor at 1133 Union St., San Diego.

Key:

NA = Not applicable.

**Table 9-8 Emissions Criteria Pollutants from P-3C Aircraft, NAS North Island, California (Projected Baseline Year: 2012)**

Operation	Baseline Emissions (tpy)				
	CO	NO <sub>x</sub>	HC	SO <sub>2</sub>	PM <sub>10</sub>
Flight Operations	18.5	10.6	12.1	0.7	5.4
Maintenance	0	0	0	0	0
<b>P-3C Total</b>	<b>18.5</b>	<b>10.6</b>	<b>12.1</b>	<b>0.7</b>	<b>5.4</b>
POVs	3.32	0.33	0.35	0.01	0.04
<b>Total</b>	<b>21.8</b>	<b>21.6</b>	<b>24.5</b>	<b>1.3</b>	<b>10.8</b>

Key:

CO = Carbon monoxide.

HO = Hydrocarbons.

NO<sub>x</sub> = Nitrogen oxides.

PM = Particulate matter less than 10 microns in diameter.

SO<sub>2</sub> = Sulfur dioxide.

## 9.5 Socioeconomics

Currently available data on population, housing, employment, taxes and revenue, and education were used to project socioeconomic conditions in the baseline year, 2012. The discussion below indicates the assumptions made and describes how the final estimated numbers were reached.

### 9.5.1 Population and Housing

#### 9.5.1.1 Population

##### NAS North Island

NAS North Island is located on Coronado Island, in the city of San Diego, California. It is host to numerous tenant organizations on base. The San Diego region in general has a heavy military presence. In addition to NAS North Island, local military (Navy and non-Navy) installations include Naval Air Base (NAB) Coronado, NAS Point Mugu, Marine Corps Air Station (MCAS) Miramar, and Camp Pendleton. The number of personnel stationed at NAS North Island has fluctuated and slightly decreased in recent years. Table 9-9 presents historical and baseline personnel loading figures for the base. The change is primarily from the reduction in the number of civilians and contractors associated with NAS North Island.

**Table 9-9 Personnel Loading Summary for NAS North Island**

	1995	2006	2012	% Change from 1995 to 2012
Military	19,098	22,934	16,494	(-)14%
Civilians	6,743	7,110	4,262	(-)37%
Contractors	1,082	-	731	(-)32%
<b>Total</b>	<b>26,923</b>	<b>30,044</b>	<b>21,487</b>	<b>(-)20%</b>

Source: EDAW, Inc. 2000; Mytych, L. 2007

**City of San Diego and Region.** The city of San Diego has been experiencing significant and intense population growth over the past couple of decades. In fact, San Diego is one of the top ten most populous cities in the United States, and the current growth trend is projected to continue.

The county's population gains during the past decade have been heavily concentrated in developing suburban areas. Specifically, North County and North City areas as well as areas east of the city experienced much of this growth, while a scarcity of land for residential development limited population growth in central San Diego and Coronado (EDAW, Inc. 2000). Table 9-10 presents population statistics for the study area from 1990 to 2010.

**Table 9-10 Population of NAS North Island Region (1990-2010)**

	1990	2000	2005	2010	% Change from 1990 to 2010
San Diego County	2,498,016	2,813,833	2,936,609	3,235,675	(+)30%
Coronado	26,540	24,226	NA	NA	(-)9%
San Diego (City)	1,110,549	1,223,341	1,255,540	1,370,300	(+)23%

Source: U.S. Census Bureau 2000; U.S. Census Bureau 2005; County of San Diego January 2007; San Diego Association of Governments June 2004.

The area immediately outside NAS North Island (Coronado) has not experienced the same kind of growth as other sections of the county, primarily because the island is densely built out with established high-end neighborhoods that can not accommodate large-scale new residential expansion other than redevelopment projects.

### **9.5.1.2 Housing**

#### **NAS North Island**

Housing at NAS North Island is primarily located on the eastern portion of the property. The area south of McCain Boulevard has been identified as the primary expansion area for bachelor enlisted quarters.

A discussion of military family housing is not required for NAS North Island because all alternatives propose a periodic squadron detachment in which personnel associated with that detachment are unaccompanied. Thus, no additional families or family housing would be required under any of the alternatives at NAS North Island.

#### **City of San Diego and Region**

The number of housing units in San Diego County and other municipalities local to NAS North Island have increased from 1990 to 2000. In 1990, there were an estimated 946,240 housing units in the county and, as seen in Table 9-11, an estimated 1,040,149 total housing units in 2000 (U.S. Census Bureau 2000). This would represent an increase of 10% in that ten-year period. This growth in housing units is approximately in keeping with the level of population growth the county experienced over the same time period.

**Table 9-11 Regional Housing Availability (2000)**

	Housing Units			Total	Vacancy Rate (%)
	Owner-Occupied	Renter-Occupied	Vacant		
San Diego County	551,489	443,188	45,472	1,040,149	4%
Coronado	3,996	3,769	1,757	9,522	19%
San Diego (City)	223,275	227,407	19,074	469,756	4%

Source: U.S. Census Bureau 2005.

The municipalities in the study area around NAS North Island have a very high renter-occupancy rate, sometimes more than half of the occupied units. Table 9-11 provides further detail about the regional housing market surrounding NAS North Island.

Vacancy rates for these geographic areas range from 4% to 19%. Housing units in the city of Coronado tend to have a higher vacancy; however, 77% of these vacancies are due to seasonal, recreational, or occasional use (U.S. Census Bureau 2005).

## **9.5.2 Economy**

### **9.5.2.1 NAS North Island**

NAS North Island is one of many Navy (and other military) installations in the San Diego region. Other military installations include Marine Corps Air Station/Marine Corps Base (MCAS/MCB) Camp Pendleton, MCAS Miramar, Naval Base San Diego, Naval Base Point Loma, and others. The economic impact of these combined military bases in the San Diego region was calculated in January 2007 by the San Diego Regional Chamber of Commerce in *The Economic Impact of the U.S. Military on the San Diego Region*. This report notes a range of items of economic interest, from the value of assets and real estate to the number of personnel or individuals employed and spending in the local community. In general, this information is aggregated over all military installations. Information from this report is briefly summarized here; the discussion includes the specific impact of NAS North Island as distinguished from the regional impact.

There is a strong military presence in the San Diego region. Although the region has diversified away from defense in recent years, the military continues to be an important contributor to the overall economic health of the region (San Diego Region Chamber of Commerce January 2007). The January 2007 study indicates the military remains a significant contributor to the local economy. It is the second largest employer: in fiscal year (FY) 2004 the military spent \$11.7 billion in the region, which accounted for 9.34% of the total economic output of the county. San Diego ranks first among all counties in the U.S. for defense spending, making it one of the largest beneficiaries of incoming federal defense dollars (San Diego Region Chamber of Commerce January 2007).

In 2004, the full economic impact of the U.S. military was approximately \$18.3 billion in gross regional product. This comprises 14.65% of San Diego's total economic activity (San Diego Region Chamber of Commerce January 2007).

NAS North Island is aggregated under Naval Base Coronado in this study, where 22,934 military personnel are stationed and 7,110 civilians were employed as of September 2006. It is estimated that in FY 2004, Naval Base Coronado had a total economic output of \$1.98 billion (San Diego Region Chamber of Commerce January 2007).



### **9.5.2.2 San Diego and Region**

Beyond the military, other major contributors to San Diego's economy are manufacturing and tourism. Manufacturing, which is correlated to some extent with the military, includes industries such as shipbuilding, aerospace, and electronics, which contribute \$17 billion to the San Diego region. Visitor spending is the third-largest industry, contributing \$3.8 billion to the local economy (EDAW, Inc. June 2000).

In 2006, the total unemployment rate for San Diego County and the city of San Diego was 4.0% of the total labor force (U.S. Department of Labor 2007). This was slightly lower than the state of California and was the lowest rate since 2000, when it was 3.9%. Table 9-12 lists annual unemployment rates from 2000 to 2006 for the three geographic areas. Note that the unemployment rate for San Diego County and the city of San Diego are identical for all years listed.

**Table 9-12 Percentage of Unemployed in the City of San Diego, San Diego County, and the State of California (2000 – 2006)**

<b>Year</b>	<b>State of California</b>	<b>San Diego County</b>	<b>City of San Diego</b>
2000	4.9	3.9	3.9
2001	5.4	4.2	4.2
2002	6.7	5.2	5.2
2003	6.8	5.2	5.2
2004	6.2	4.7	4.7
2005	5.4	4.3	4.3
2006	4.9	4.0	4.0

Source: U.S. Department of Labor 2007.

### **9.5.3 Taxes and Revenues**

According to the FY 2006 Comprehensive Annual Financial Report, San Diego County government revenues totaled \$3.5 billion. The majority of this revenue was from operating grants and contributions (51% of the total), followed by property taxes (15%). Other sources of revenue for the county included charges for services; sales and use taxes; and property taxes in lieu of vehicle license fees.

County expenses incurred for FY 2006 totaled \$3.1 billion, primarily for public protection (33%) and public assistance (32%). Other recipients of the funds included health and sanitation and general government spending (County of San Diego 2006).

Based upon the FY 2006 budget and the estimated 2005 population for San Diego County, the local per capita tax burden is \$1,194 for county-related taxes.

#### **9.5.4 Education**

As noted above in the Introduction to this chapter, this resource would not be affected by the proposed action and so is not discussed in this EIS.

#### **9.5.5 Environmental Justice**

Consistent with Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* (February 11, 1994), the Navy's policy is to identify and address disproportionately high and adverse human health or environmental effects of its actions on minority and low-income populations. In addition, Executive Order 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, enacted in 1997, directs federal agencies to identify and assess environmental health and safety risks to children, coordinate research priorities on children's health, and ensure that their standards take into account special risks to children.

The analysis focuses on the potential for a disproportionate and adverse exposure of these specific off-base population groups to projected aircraft noise under alternatives at each base where a "greater than 65 DNL noise exposure" would be the greatest. The results of the analysis of these scenarios are similar, whether using the alternative with the most squadrons allocated to that base or the least number, the only exception being alternatives where no P-8A MMA squadrons are proposed.

In this analysis, minority and low-income populations and children were defined as follows:

- **Minority.** Individuals who are Black/African-American, Asian, Pacific Islander, American Indian, Eskimo, Aleut, or other non-white persons (a separate distinction has been made for people of Hispanic origin).
- **Low-Income.** Individuals living below poverty as defined by the U.S. Census Bureau.
- **Children.** Individuals under the age of 18.

Statistics pertinent to the study area surrounding NAS North Island are summarized in Table 9-13 below. (Section 10.5.5 presents data on individual census tracts that would be most affected by aircraft noise [i.e., all census tracts crossed or encompassed by the 65 dB CNEL noise contour]).

**Table 9-13 Environmental Justice Statistics for NAS North Island Analysis (2000)**

	<b>Total Population</b>	<b>Percent Minority</b>	<b>Percent Hispanic</b>	<b>Percent Low Income</b>	<b>Percent Children</b>
State of California	33,871,648	40.6	32.4	14.2	27.2
San Diego County	2,813,833	33.6	26.7	12.4	25.6
City of San Diego	1,223,341	39.9	25.4	14.6	23.9
City of Coronado	24,226	15.4	9.2	5.0	16.1

Source: U.S. Census Bureau 2000.

The comparison geographic areas for this environmental justice analysis are the cities of Coronado and San Diego, San Diego County, and the state of California. Data from the year 2000 has been used in this analysis because census tract-level data are not available for any year after 2000.

## **9.6 Infrastructure and Utilities**

As noted above in the Introduction to this chapter, these resources would not be affected by the proposed action and so are not discussed in this EIS.

## **9.7 Community Services**

As noted above in the Introduction to this chapter, these resources would not be affected by the proposed action and so are not discussed in this EIS.

## **9.8 Transportation**

As noted above in the Introduction to this chapter, transportation would not be affected by the proposed action and so is not discussed in this EIS.

## **9.9 Topography and Soils**

As noted above in the Introduction to this chapter, these resources would not be affected by the proposed action and so are not discussed in this EIS.

## **9.10 Water Resources and Wetlands**

As noted above in the Introduction to this chapter, these resources would not be affected by the proposed action and so are not discussed in this EIS.

## **9.11 Biological Resources**

### **9.11.1 Vegetation**

As noted above in the Introduction to this chapter, vegetation would not be affected by the proposed action and so is not discussed in this EIS.

### **9.11.2 Wildlife**

Wildlife species diversity and abundance on NAS North Island is limited to a certain extent by the extensive development and limited area of natural habitats on the station. Various small mammals such as skunks, raccoons, bats, ground squirrels, and opossums may be found on developed areas of the station. Some lizard species such as the western fence lizard (*Sceloporus occidentalis*) and the side-blotched lizard (*Uta stansburiana*) are also frequently found around buildings at the station.

A managed heron rookery occurs in the northeastern portion of the station. Herons nest in a cluster of trees in this rookery and forage in San Diego Bay. The rookery is also used by black-crowned night herons and snowy egrets.

Species diversity is greatest at NAS North Island on and near the sandy beaches and coastal salt marsh habitats along the station's southern border. Various species of migratory and resident birds use these areas for foraging and nesting. Some seabirds, including cormorants and gulls, use steep artificial shorelines as elevated perches. Invertebrates such as lobsters, crabs, worms, mussels, barnacles, echinoderms (starfish and sea urchins), sponges, sea anemones, and sea squirts inhabit the station's artificial shorelines and natural intertidal habitats. Seaweed and eelgrass beds in these areas are important refuge and feeding areas for various juvenile and predatory fish, including perch, bass, dogfish, opaleye, and croaker. Topsmelt, arrow goby, California killifish, longjaw mudsucker, young round stingray, and California halibut inhabit upland transition marsh habitats, which are transition zones between coastal scrub and upper marsh habitats (U.S. Department of the Navy 2002).

#### **9.11.2.1 Migratory Birds**

The Migratory Bird Treaty Act (MBTA) is the primary legislation in the United States established to conserve migratory birds. The MBTA prohibits taking, killing, or possessing migratory birds unless permitted by regulation. Under 50 CFR Part 21, the Armed Forces are authorized to take migratory birds during military readiness activities; however, the Armed Forces must confer and cooperate with the U.S. Fish and Wildlife Service (USFWS) on the development and implementation of conservation measures to minimize or mitigate adverse effects of military readiness activities if it determines that such activity may have a significant adverse effect on a population of migratory birds. Congress defined military readiness activities as all training and operations of the Armed Forces that relate to combat and the adequate and realistic testing of military equipment, vehicles, weapons, and sensors for proper operation and suitability for combat use. An activity has a significant adverse effect if, over a reasonable period of time, it diminishes the capacity of a population of a migratory bird species to maintain genetic diversity, to reproduce, and to function effectively in its native ecosystem.

The migratory bird species under long-term management and inventory at NAS North Island include the brown pelican (*Pelecanus occidentalis californicus*), dowitcher (*Limnodromus* sp.), black brant (*Branta bernicla nigricans*), lesser scaup (*Aythya affinis*), surf scoter (*Melanitta perspicillata*), and western snowy plover (*Charadrius alexandrinus nivosus*) (U.S. Department of the Navy 2002).

#### **9.11.2.2 Bird-Aircraft Strike Hazards**

The presence of resident and migratory birds creates a bird-aircraft strike hazard (BASH) risk at NAS North Island. The airfield's proximity to marine waters, several large hangars, and expanses of grass adjacent to the airfield enhances the BASH risk. NAS North Island has prepared a BASH plan to reduce the potential for collisions between aircraft and birds or other animals. The BASH plan prescribes an ongoing process involving the distribution of information and active and passive measures to control how birds use critical areas around the airfield. Methods outlined in the plan to reduce BASH hazards at the airfield include habitat management, bird dispersal and depredation, and bird avoidance (U.S. Department of the Navy 2002).

### 9.11.3 Threatened and Endangered Species

The ESA of 1973 and subsequent amendments provide for conservation of threatened and endangered species of animals and plants and the habitats in which they are found. The Navy ensures that consultations are conducted as required under Section 7 of the ESA for any action that “may affect” a federally listed threatened or endangered species. Although the protection of species that are listed at the state level as threatened or endangered is not legally mandated for federal agencies, the Navy encourages cooperation with states to protect such species where such protection is consistent with an installation’s mission.

The USFWS and National Oceanic and Atmospheric Administration (NOAA) Fisheries were contacted to obtain updated information on protected species on and in the vicinity of NAS North Island. Neither agency responded to the data request; however, agency websites and NAS North Island’s INRMP provide sufficient information on the occurrence of protected species on and near the station (U.S. Fish and Wildlife Service August 2007; California Department of Fish and Game August 2007).

Federally listed threatened and endangered species occurring within or in the immediate vicinity of NAS North Island and adjacent waters are the California least tern (*Sterna antillarum browni*), western snowy plover (*Charadrius alexandrinus nivosus*), and California brown pelican (*Pelecanus occidentalis californicus*). The current federal protection status of each of these species is indicated in Table 9-14.

**Table 9-14 Federally Protected Species and Species of Concern at or in the Vicinity of NAS North Island**

Species Common Name			Status	
Category	Name	Species Scientific Name	Federal	State
Federal Threatened and Endangered Species				
Birds	California least tern	<i>Sterna antillarum browni</i>	E	E
	Western snowy plover	<i>Charadrius alexandrinus nivosus</i>	T	SSC
	California brown pelican	<i>Pelecanus occidentalis californicus</i>	E	E
Other Species of Concern <sup>1</sup>				
Mammals	San Diego black-tailed jackrabbit	<i>Lepus californicus bennettii</i>	FSC	SSC
Birds	Osprey	<i>Pandion haliaetus</i>	-	SSC
	Sharp-shinned hawk	<i>Accipiter striatus</i>	-	SSC

**Table 9-14 Federally Protected Species and Species of Concern at or in the Vicinity of NAS North Island (continued)**

Category	Species Common Name	Species Scientific Name	Status	
			Federal	State
	Cooper's hawk	<i>Accipiter cooperi</i>	-	SSC
	Burrowing owl	<i>Athene cunicularia hypugea</i>	FSC	SSC

Sources: U.S. Department of the Navy 2002; U.S. Fish and Wildlife Service August 2007; California Department of Fish and Game 2007

Note:

<sup>1</sup> These species are not protected under federal law.

Status Codes:

E = Endangered.

FSC = Federal Species of Concern.

SSC = Species of Special Concern.

T = Threatened

- = Not Listed.

### 9.11.3.1 California Least Tern

The California least tern nests on “open sandy or gravelly shores with light-colored substrates, little vegetation, and nearby fishing waters” and will generally return to nesting sites where they have successfully raised broods in the past (U.S. Department of the Navy 2002). They are opportunistic predators and will feed on various fish species small enough to catch. California least terns forage in the surface waters of different marine and coastal habitats, depending on the availability of prey and the stage of breeding.

NAS North Island manages an approximately 22-acre, fenced California least tern nesting site in the central portion of the airfield, adjacent to McCain Boulevard West and Hangar Road. Alternate tern nesting sites, totaling approximately 30 acres, are located to the south and west of the runways. To comply with a 1987 Memorandum of Understanding (MOU) with the USFWS, NAS North Island conducts ongoing predator control and tern management activities at these sites. No California least tern nests have been recorded at the alternate tern nesting sites. The alternate nesting sites were abandoned (with agreement from the USFWS) in 2001. Surveys of the 22-acre nesting site have been ongoing since 1976; 146 nests were recorded at this site in 2008 (Ostapuk 2008).

### 9.11.3.2 Western Snowy Plover

Western snowy plovers nest in colonies on sandy beaches along the west coast of the United States and into Southern Baja California (U.S. Department of the Navy 2002). Nesting

sites are generally free of thick vegetation and driftwood. The diet of western snowy plovers mainly consists of terrestrial and aquatic invertebrates such as amphipods, sand hoppers, and flies. Important foraging habitats for this species include mudflats and kelp wracks, which are piles of detached kelp deposited on beaches by the tide (U.S. Department of the Navy 2002).

The majority (78%) of coastal breeding colonies in California occur north of San Diego County from San Francisco Bay to Oxnard and the Channel Islands; a smaller portion of the population of western snowy plovers breeds and forages along the San Diego Bay shoreline. In 2004, 43 nesting pairs were recorded in the San Diego Bay area; approximately 12 to 13 pairs were estimated to nest at NAS North Island (U.S. Fish and Wildlife Service June 20, 2005). Due to BASH concerns, nesting is discouraged on the station's airfield through use of various hazing techniques. Any eggs laid on the airfield are collected and, once hatched, the chicks are reared in captivity and later released. Alternate plover nesting sites are provided on approximately 15 acres of managed land along the station's southern beach. Plovers are often observed during non-breeding season along the bay-side and ocean shorelines of the station, which are used for roosting (U.S. Department of the Navy 2002; U.S. Fish and Wildlife Service June 20, 2005).

#### **9.11.3.3 California Brown Pelican**

California brown pelicans frequent estuaries and marine subtidal and pelagic waters. They roost primarily on dikes and other artificial structures, seldom roosting on natural structures. Up to 85% of the California brown pelican's breeding population of about 7,000 pairs (Small 1994) nests on the Coronado Islands off the coast of Baja California, Mexico (Schoenherr 1992). The only breeding population in California is on Anacapa Island, approximately 130 miles northwest of NAS North Island.

California brown pelicans regularly roost on piers and pilings around NAS North Island. They can be seen in San Diego Bay foraging in shallow to medium-depth waters and around bait barges where food is abundant (U.S. Department of the Navy 2002).

#### **9.11.3.4 Other Species of Concern**

Other species of concern on or in the immediate vicinity of NAS North Island are the osprey, sharp-shinned hawk, Cooper's hawk, burrowing owl, and the San Diego black-tailed jack-rabbit. The current protection status of these species is indicated in Table 9-14.



Ospreys are known to have nested on NAS North Island in the past, while transient occurrences of sharp-shinned hawks and Cooper's hawks have been recorded on the station. NAS North Island supports the largest coastal colony of burrowing owls in the country. Burrowing owl nest sites are in open areas in the southern portion of the installation. The San Diego black-tailed jackrabbit occupies habitat similar to the burrowing owl habitat at the southeastern section of NAS North Island, around the golf course (U.S. Department of the Navy 2002).

#### **9.11.4 Marine Mammals**

The Marine Mammal Protection Act (MMPA) is administered by the USFWS and NOAA Fisheries to protect and manage marine mammals. The protection of coastal marine mammal species such as the manatee is under the jurisdiction of the USFWS. Three species protected under the MMPA are known to occur in San Diego Bay: coastal bottlenose dolphin, California sea lion, and Pacific harbor seal. The California sea lion and Pacific harbor seal are occasionally observed on NAS North Island coastal beaches. San Diego Bay is not a common habitat for whales and other dolphin species (U.S. Department of the Navy 2002).

#### **9.12 Cultural Resources**

The 1966 National Historic Preservation Act (NHPA), Public Law 89-665, as amended by Public Law 96-515, 16 U.S.C. 470 et seq., establishes the National Register of Historic Places (NRHP), which includes historic properties such as districts, sites, buildings, structures, and objects significant in American history, architecture, archaeology, and culture. Section 106 of the NHPA requires that federal agencies with jurisdiction over a proposed federal project take into account the effect of actions on cultural resources listed or eligible for listing on the NRHP and affords the State Historic Preservation Office and the Advisory Council on Historic Preservation (ACHP) an opportunity to comment with regard to an undertaking. The NRHP eligibility criteria are defined by the Secretary of the Interior's Standards for Evaluation (36 CFR 60).

A National Register resource is a building, structure, site, district, or object included in or eligible for inclusion in the NRHP. Properties qualifying for the NRHP must generally be at least 50 years old; possess integrity of location, design, setting, materials, workmanship, feeling, and association; and meet one or more of the following criteria:

- **Criterion A.** Properties that are associated with events that have made a significant contribution to the broad patterns of our history;
- **Criterion B.** Properties that are associated with the lives of persons significant in our past;
- **Criterion C.** Properties that embody the distinctive characteristics of a type, period, or method of construction; or
- **Criterion D.** Properties that have yielded, or may be likely to yield, information important in prehistory or history (36 CFR 60.4).

The Navy has conducted inventories of cultural resources at NAS North Island to identify historical properties listed or potentially eligible for listing in the NRHP (Chambers Consultants and Planners 1982; Williamson and Watts, Architects 1988).

#### **9.12.1 Architectural Resources**

NAS North Island has 82 buildings and structures with historical and architectural value that might qualify them for listing in the NRHP. These buildings have been grouped by historical association and in 1990 were placed in the NRHP as the “NAS San Diego Historic District” and “U.S. Army Rockwell Field Historic District.”

The NAS San Diego Historic District is associated with the initial development and use of the former NAS San Diego between 1917 and 1938. This district is located in the northern part of NAS North Island and consists of 35 buildings and 5 structures; 26 of these buildings are considered potentially eligible for listing on the NRHP. The NAS San Diego Historic District is significant because of its local and national ties to early military aviation and architectural designs. The district and buildings are eligible for listing in the NRHP under Criterion A and C (Yatsko 1998).

The U.S. Army Rockwell Field Historic District is located in the southeastern section of NAS North Island. The district contains 63 buildings, and approximately 56 of the buildings are considered to be potentially eligible for listing on the NRHP. The area is significant due to its association with the use and development of the Rockwell airfield, the first permanent Army airfield in the United States. The district and buildings are eligible for listing in the NRHP under Criteria A and C (Yatsko 1998).

There are 13 other buildings at NAS North Island that are not located within the two historical districts but that are considered to be eligible for listing on the NRHP; however, their eligibility has not been formally evaluated (Naval Facilities Engineering Command 2000).

#### **9.12.2 Archaeological Resources**

Eight archaeological sites have been identified on NAS North Island. During a phased investigation in 1995, two sites were identified as significant and were recommended as eligible for listing on the NRHP (Naval Facilities Engineering Command 2000).

#### **9.13 Environmental Management**

As noted above in the Introduction to this chapter, the use of hazardous waste or materials would not be affected by the proposed action and so is not discussed in this EIS.

## **10 Environmental Consequences: NAS North Island**

### **Introduction**

NAS North Island is a site for replacing P-3C aircraft with P-8A MMA under all alternatives other than the No Action Alternative. Under Alternatives 1 through 6, periodic squadron detachments would operate from NAS North Island. P-8A MMA personnel would number 167, representing a gain of 17 when compared with the number of P-3C personnel. As noted in Section 2, Alternative 5 is the preferred alternative.

Discussions of potential environmental impacts associated with all alternatives at NAS North Island are included in this section. Section 1 of the EIS defines 2011 as the existing condition baseline year for the analysis presented in this EIS because it is the year prior to the introduction of the P-8A MMA. However, in a few instances the best available data were available only for an alternate year, ranging from 2010 to 2013. In such instances, where data from a year other than 2011 were used to support the analysis, the year and data source is specifically identified within the text. The baseline also defines the No Action Alternative conditions.

Table 10-1 shows all existing and projected aircraft loading at NAS North Island. Table 10-2 shows the projected aircraft and personnel loading of the P-8A MMA compared with the existing P-3C loading. These tables are provided to guide the evaluation of proposed environmental impacts. No new construction is proposed for NAS North Island under any replacement alternative and thus no new impervious surface is proposed either.

### **10.1 Airfield Operations**

The number of annual operations at NAS North Island is projected to decrease for each of the alternatives (see Tables 10-1 and 10-2), based on the operation projections calculated using the *Patrol Reconnaissance Group's Projected P-8 Syllabus Flight Operations*. A key component of this decrease would be the use of simulators for training. Simulators minimize flight operations and thereby decrease air emissions and enhance safety by allowing personnel to practice emergency procedures without putting pilot and aircraft at risk.

All alternatives involve replacing periodic P-3C squadron detachments with P-8A MMA squadron detachments. The projected number of annual operations under Alternatives 1 through 6 would decrease by 971 operations, 1% below the existing baseline level of annual operations.

**Table 10-1 Baseline (2012) and Projected Aircraft Loading at NAS North Island Under all Alternatives**

<b>Aircraft Type</b>	<b>Existing (2012)</b>	<b>Alternatives 1 through 6</b>
C-40A	3	4
C-2A	13	13
HH-60H	5	0
MH-60S	64	54
MH-60R	50	77
NC-12B	1	1
SH-60B	20	0
SH-60F	4	0
UC-12B	1	1
UC-12M	2	2
<b>Total</b>	<b>164</b>	<b>152</b>
<b>Net Change</b>	<b>-</b>	<b>(-)12</b>

**Table 10-2 Baseline (2012) and Projected (2019) Aircraft and Personnel Loading at NAS North Island**

	<b>Existing (2012)</b>	<b>Alternatives 1 through 6</b>
<b>Aircraft</b>		
P-3C	2-9	0
P-8A MMA	0	2-6
<b>Net Change</b>	<b>-</b>	<b>0-3</b>
<b>Personnel</b>		
P-3C	Up to 150	0
P-8A MMA	0	Up to 167
<b>Net Change</b>	<b>-</b>	<b>17</b>

Note: Both the P-3C and P-8A MMA squadrons are at NAS North Island only periodically. Because these aircraft are not permanently stationed at NAS North Island, neither is listed in Table 10-1.

Under the No Action Alternative, there would be no change in the number of annual air operations (104,403).

P-8A MMA squadrons would follow the same training and deployment cycle as P-3C squadrons, and no change would be proposed to existing types of flight operations or flight tracks. Operations would consist of direct arrivals and departures and would not include touch-and-go operations.

NAS North Island meets all operational requirements of routine operating conditions to support airfield operations of P-8A MMA squadrons.

## 10.2 Noise

Projected noise contours for NAS North Island under Alternatives 1 through 6 are shown on Figure 10-1. The off-station area and estimated population within projected noise zones at NAS North Island under Alternatives 1 through 6 are shown in Table 10-3. The population shown is a proportion of the census block based on the geographic area of the noise zone. Although 2000 census data is used in this analysis, the population is assumed to have remained stable between 2000 and 2019 because residential areas are built out around NAS North Island and because historical population trends between 1990 and 2000 actually show a slight decline in population for the city of Coronado. Therefore, conservatively, no growth factors have been applied to the population within the projected noise zones at NAS North Island under these replacement alternatives.

**Table 10-3 Off-Station Area (Acres) and Estimated Population within Projected Noise Zones at NAS North Island**

Noise Zone (CNEL)	Baseline (2012)		Alternatives 1 through 6 (2019)	
	Area	Population	Area	Population
65 to 70 dB	140	1,600	138	1,563
70 to 75 dB	63	364	63	359
75 dB or greater	20	62	19	57
<b>Total</b>	<b>223</b>	<b>2,026</b>	<b>220</b>	<b>1,979</b>
<b>Net Change</b>	<b>–</b>	<b>–</b>	<b>(-)3</b>	<b>(-)47</b>
<b>Percent Net Change</b>			<b>(-)1%</b>	<b>(-)2%</b>

Source: Wyle Laboratories, Inc. July 2008.

Alternatives 1 through 6 include using NAS North Island for temporary P-8A MMA detachment operations. Under the No Action Alternative, P-3C aircraft would continue to use NAS North Island for temporary detachments. P-8A MMA replacement squadrons would be using facilities already constructed on the base. Noise contours would be similar to existing conditions because the major noise-contributing operations, which are from EA-18G, F/A-18, and C-5 aircraft, would remain the same under all alternatives, and noise levels for P-3C and P-8A MMA flight profiles are comparable (Wyle Laboratories, Inc. July 2008). Under Alternatives 1 through 6, the number of people exposed to the 65 dB community noise equivalent level (CNEL) or greater noise zone would decrease by 47 people, approximately 2% fewer people than are exposed under baseline conditions and the No Action alternative.

As shown in Table 10-3, the greatest decrease in population within a noise zone occurs in the 65 dB to 70 dB CNEL noise zone. Approximately 2% fewer people (37) would be in the 65 to 70 dB CNEL noise zone than would be exposed under current noise levels. The percent decrease in the number of people exposed to the 70 to 75 dB CNEL is approximately 1% (5 people); the number of people exposed to the 75 dB or greater CNEL noise zones would be approximately 8% (5 people) compared with current conditions.

Under Alternatives 1 through 6, noise exposure would be equivalent to noise levels currently experienced by area residents, given that there would be a net decrease in aircraft based at NAS North Island. Further discussion of the compatibility of land uses within the projected noise zones is included in Section 10.3.4.

Land area in the 65 to 70 dB CNEL noise zone would decrease slightly under Alternatives 1 through 6 (approximately 1% [2 acres]) compared with current conditions. Land area in the 70 to 75 dB CNEL noise zone would remain unchanged compared with current conditions and would decrease by approximately 5% (1 acre) in the 75 dB CNEL or greater noise zone.

As outlined in Section 9.2, the sound exposure level (SEL) (as opposed to the DNL, which represents a 24-hour average noise metric) is a composite metric that represents both the intensity of a sound and its duration. The SEL can be used to show the effect of single-level individual noise events such as aircraft overflights. Table 10-4 shows the difference in SEL noise values for both the P-3C and the P-8A MMA. While the two aircraft have different noise characteristics, the actual increase in noise would range from 1 dB to 2 dB for the P-8A MMA, depending on the aircraft flight operation. People at or in the immediate vicinity of NAS North Island would be exposed to slightly higher single-event noise levels during P-8A MMA landings compared with current landing operations completed by P-3C aircraft (Wyle Laboratories, Inc. July 2008).

**Table 10-4 Single-Event Sound Levels for the P-3C and P-8A MMA**

Aircraft	Condition	Power Setting	Speed (KIAS)	SEL Value dB 1000 feet
P-3C	Take-off	3500 ESHP	115	94
	Landing	500 ESHP	121	85
P-8A MMA	Take-off	19204 LBS	148	95
	Landing	5530 LBS	135	87

Source: Wyle Laboratories, Inc. July 2008.

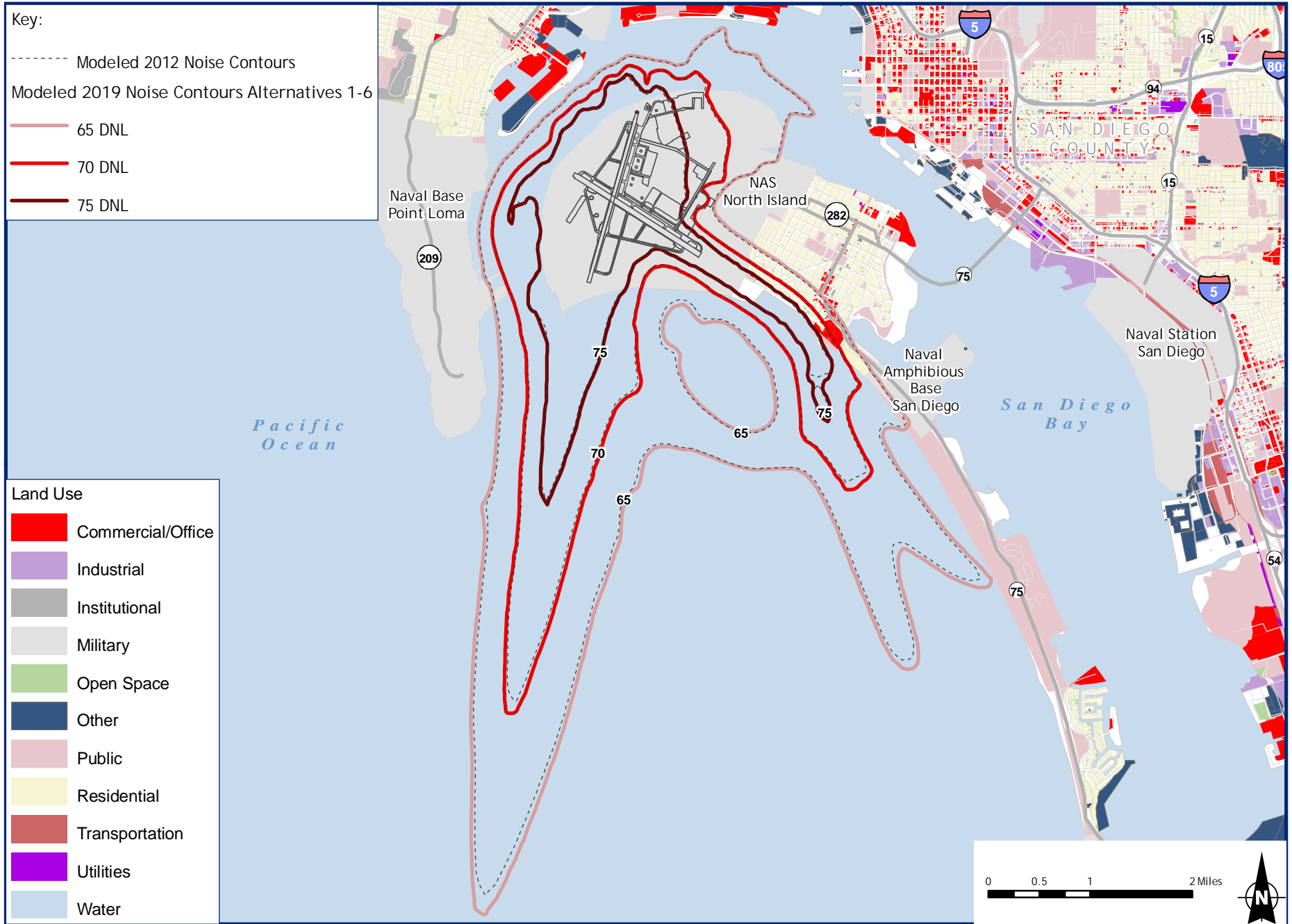


Figure 10-1  
 Comparison of Modeled 2012 CNEL Noise Contours  
 and 2019 CNEL Noise Contours Projected Under Alternatives 1-6  
 NAS North Island, California



## **10.3 Land Use**

### **10.3.1 NAS North Island Land Use**

On-station land use at NAS North Island would not change under any of the replacement alternatives. No new construction would be required on-station to support periodic detachments of P-8A MMA squadrons because existing facilities are sufficient.

### **10.3.2 Regional Land Use**

The proposed action would not result in land-use conflicts with surrounding land uses off-station nor would it result in any indirect growth-induced development because under all replacement alternatives the number of personnel employed at NAS North Island would increase by only 17 personnel.

Projected noise zones under all homebasing alternatives would cover less land off-station than contained in the baseline contours. A land-use compatibility assessment of the alternatives is presented in Section 10.3.4.

### **10.3.3 Land-Use Controls**

The proposed action has been evaluated relative to the following land-use controls:

- The Navy and Marine Corps Air Installations Compatible Use Zones (AICUZ) Program;
- The 2002 Naval Base Coronado Integrated Natural Resources Management Plan (INRMP)
- The City of Coronado General Plan; and
- The California Coastal Management Program (CCMP).

#### **AICUZ Program**

**Noise.** Implementation of the proposed action under all alternatives would be consistent with the NAS North Island AICUZ study. Projected noise zones following replacement of the P-3C with the P-8A MMA under all alternatives would result in a small decrease in the amount of land area exposed to aircraft noise (e.g., greater-than-65 dB CNEL). Consequently, a new AICUZ study for NAS North Island would not be necessary. Furthermore, the proposed action does not affect the goals of the program or land use recommendations for land that is considered compatible with aircraft operations and is consistent with community development plans.

**APZ.** The number and type of airfield operations and flight tracks are used as the basis for identifying APZs around an air station. While the projected number of airfield operations would be slightly reduced at NAS North Island, flight tracks would remain the same with replacement of P-3C aircraft with P-8A MMA. As a result, APZs at NAS North Island would not change under any replacement alternative.

### **Integrated Natural Resources Management Plan (INRMP)**

The proposed action would have no effect on natural resources at NAS North Island and therefore would be consistent with management objectives designed to protect and preserve the mission of NAS North Island and on-station natural resources.

### **City of Coronado General Plan and Zoning Ordinances**

The proposed action is not expected to affect the city of Coronado's General Plan and zoning ordinances because the number of station personnel would increase only slightly, there would be no new construction, and exposure to noise would be slightly reduced. The Navy would continue to work with the city of Coronado to plan for compatible land-use development within the projected noise zones at NAS North Island.

### **Federal Consistency with the California Coastal Management Program (CCMP)**

The proposed action at NAS North Island would have no effect on any coastal uses or resources. Consequently, a detailed Coastal Consistency Determination is not required.

#### **10.3.4 Land-Use Compatibility Assessment**

Aircraft operations associated with supporting periodic detachments of P-8A MMA at NAS North Island would result in a less than 1% overall decrease in the acreage of land and water located within the projected greater-than-65 dB CNEL noise zones (see Figure 10-1). Table 10-5 shows the change in land uses around NAS North Island between the modeled baseline and projected noise contours under the aircraft replacement alternatives.

**Table 10-5 Net Change in Area within the Projected Greater-than-65 dB CNEL Noise Zones around NAS North Island under Alternatives 1 through 6**

Land Use	Acres			% Net Change
	Total Area Baseline (2012)	Total Area Alternatives 1 through 6	Net Change	
Residential	117	114	(-)3	(-) <1
Commercial/Office	33	32	(-)1	(-) <1
Institutional	1	1	0	0
Recreation/Open Space	131	130	(-)1	(-) <1
Transportation/Utilities	80	78	(-)2	(-) <1
Military	2,251	2,250	(-)1	(-) <1
Water	7,452	7,388	(-)64	(-)1
<b>Total</b>	<b>10,065</b>	<b>9,993</b>	<b>(-)72</b>	<b>(-)1</b>

## 10.4 Air Quality

Air quality impacts associated with the proposed action are related to emissions from changes in aircraft operations and privately owned vehicles (POVs). (No construction is planned at North Island as part of the proposed action.) Air emissions would result from flight operations of P-8A MMA and POVs belonging to new station personnel. Because emissions associated with the proposed action would be offset by decreased emissions as a result of discontinued use of P-3C aircraft, *total changes* in emissions have been evaluated. Other site air emissions, such as those from stationary sources, other aircraft and station vehicles, ground support equipment (GSE), and other sources are assumed to remain constant under this action. Cumulative impacts are discussed in Section 11.

### 10.4.1 Mobile Source Emissions

Mobile source emissions considered in this analysis include P-8A MMA flight and maintenance operations and POV operated by new station personnel. Air emissions associated with existing aircraft operations and the change in emission totals for replacement aircraft and POV operations are shown in Table 10-6.

Emissions from P-8A MMA flight operations and maintenance operations are based upon emission indexes developed by the International Civil Aviation Organization (ICAO) for the CFM56-7B26 engine, which would be used in the P-8A MMA (International Civil Aviation Organization July 2007). Time-in-mode assumptions for landing-takeoff cycles (LTOs) were obtained from the Federal Aviation Administration (FAA) Emissions and Dispersion Modeling

System (EDMS) (June 29, 2007), which provides default time-in-mode values for the Boeing 737-800 series aircraft. Time-in-mode assumptions for touch-and-go and ground control approach (GCA) box operations were adapted from P-3C time-in-mode assumptions from the Aircraft Environmental Support Office (April 2000). Emissions from POVs were estimated based on the California Air Resources Board's EMFAC 2007 conservative emission values for vehicle emissions (California Air Resources Board March 27, 2007) and on changes in personnel estimates, summarized in Table 10-2. Emission factors and calculations are detailed in Appendix H.

**Table 10-6 P-8A MMA and POV Emissions at NAS North Island – Alternatives 1 through 6**

Flight Operation	No. of Operations <sup>1</sup>	Baseline Emissions (tpy) <sup>2</sup>				
		CO	NO <sub>x</sub>	HC	SO <sub>2</sub>	PM <sub>10</sub>
<b>Alternatives 1 through 6</b>						
Straight-In Arrival LTOs	540	4.6	8.1	0.5	0.7	0.2
Touch-and-Go	0	0.0	0.0	0.0	0.0	0.0
GCA Pattern	0	0.0	0.0	0.0	0.0	0.0
Maintenance Run-Ups	0	0.001	0.006	0.000	0.000	0.000
<b>Total P-8A MMA Flight Operations Emissions</b>		<b>4.6</b>	<b>8.1</b>	<b>0.5</b>	<b>0.7</b>	<b>0.2</b>
Baseline P-3C Emissions		18.5	10.6	12.1	0.7	5.4
Change in Aircraft Emissions		(-)13.9	(-)2.5	(-)11.6	0.1	(-)5.1
Change in POV Emissions		0.38	0.04	0.04	0.001	0.005
<b>Total Change in Mobile Operations Emissions</b>		<b>(-)13.5</b>	<b>(-)2.5</b>	<b>(-)11.6</b>	<b>0.1</b>	<b>(-)5.1</b>

Notes:

<sup>1</sup> Operations information from Wyle Laboratories, Inc. July 2008.

<sup>2</sup> Emissions calculated using emission factors from the International Civil Aviation Organization (2002) and California Air Resources Board (2007) (see Appendix H).

Key:

CO = Carbon monoxide.

NO<sub>x</sub> = Nitrogen oxides.

HC = Hydrocarbons.

SO<sub>2</sub> = Sulfur dioxide.

PM<sub>10</sub> = Particulate matter less than 10 microns in diameter.

tpy = Tons per year.

VOC = Volatile organic compound.

#### **10.4.2 Air Quality Impacts**

NAS North Island is in the San Diego Air Basin (SDAB) and is contiguous with the borders of San Diego County. The SDAB currently meets federal and state standards for all criteria pollutants except ozone. The SDAB is presently in "basic" nonattainment for the 8-hour ozone standard (whose precursor emissions are volatile organic compounds [VOCs] and nitrogen oxides [NO<sub>x</sub>] (U.S. Environmental Protection Agency 2007). The SDAB is also a maintenance

area for the carbon monoxide (CO) standard (former nonattainment areas that have attained the National Ambient Air Quality Standards [NAAQS]).

As discussed in Chapter 9, the General Conformity Rule (40 Code of Federal Regulations [CFR] §§ 51.850-860 and 40 CFR §§ 93.150-160) requires any federal agency responsible for an action in a nonattainment area to ensure that the action conforms to the applicable State Implementation Plan (SIP) or to demonstrate that the action is exempt from the General Conformity Rule requirements. Total annual emissions from changes in aircraft operations are summarized in Table 10-6 for all alternatives. The annual conformity de minimis thresholds for the SDAB are 100 tons per year of VOCs, NO<sub>x</sub>, and CO. Since the total change in emissions would decrease as a result of this action, a conformity determination is not required. There would be no impacts on the region's air quality. Under the No Action Alternative, operations of the P-3C and staff levels would remain the same as baseline conditions, resulting in no change to air quality emission totals or conditions.

## **10.5 Socioeconomics**

### **10.5.1 Population and Housing**

#### **10.5.1.1 Population: Alternatives 1 through 6**

All alternatives include periodic detachments of P-8A MMA squadrons at NAS North Island. The additional personnel (167 total) associated with these alternatives are not permanent military or civilian/contractor personnel and would be located only temporarily at NAS North Island during each detachment. These additional personnel would not have a significant impact on the population at the base or on local municipalities because their permanent residences would be elsewhere.

The 167 personnel would comprise both military and contractor logistics support personnel (CLS). CLS would provide basic maintenance, preventive maintenance, inspections, servicing/replacement of various aircraft components, and specialized repair of inoperative components. As with military personnel, CLS would not be permanently based at NAS North Island and so there would be no associated changes in the number of military or civilian dependents (e.g., spouses and children) on the base under any alternative.

#### **10.5.1.2 Population: No Action Alternative**

Under the No Action Alternative, the P-3C would not transition to the P-8A MMA; thus, no change in required personnel would take place. The existing base and regional population would not be directly impacted under the No Action Alternative.

#### **10.5.1.3 Housing: Alternatives 1 through 6**

When a squadron detachment is stationed at NAS North Island, personnel would live in bachelor enlisted quarters or bachelor officer quarters, on-base transients lodging, or off-base in local hotels for the duration of their stay. They would not be permanently stationed at NAS North Island; thus, they would not impact the local housing market in any way. Adequate accommodations in the San Diego area are available locally for any personnel not accommodated in on-base temporary housing. Personnel associated with periodic squadron detachments would not have a significant impact on the local housing market.

#### **10.5.1.4 Housing: No Action Alternative**

Under the No Action Alternative, the P-3C would not transition to the P-8A MMA; thus, no change in required personnel would take place as well as no change in the current housing market. The existing base and regional housing market would not be directly impacted under the No Action Alternative.

### **10.5.2 Economy**

#### **10.5.2.1 Alternatives 1 through 6**

No construction is proposed for NAS North Island under any of the P-8A MMA replacement alternatives. Thus, the only impact on the regional economy at NAS North Island would be a slight positive impact from additional personnel spending money in the area. Even this impact would be minimal as military and civilian/contractors would be unaccompanied and would spend only a small portion of their time and disposable income in the region.

Any changes in station expenditures supporting businesses and services within the San Diego region would also be minimal. The changes in station expenditures would be minimal due to the small increase in the number of personnel, fewer than 17 individuals. Thus, no significant economic impacts would be associated with implementation of these alternatives, other than

temporary expenditures on hotel stays for those who cannot be accommodated in on-base housing.

#### **10.5.2.2 No Action Alternative**

Under the No Action Alternative, P-3C aircraft would not transition to P-8A MMA and no change in personnel would occur. Base payroll figures would remain as existing, and there would be no impact on the disposable income available in the local region.

#### **10.5.3 Taxes and Revenues**

Under all alternatives military or civilian/contractor personnel would not be permanently stationed at NAS North Island. Thus, there would be no direct impact on local property taxes or tax revenue collected by local municipalities. There may be a slight positive impact from local bed taxes collected from personnel staying in local hotels during their temporary stay at NAS North Island. This amount would depend on the number accommodated in on-base housing during their stay. Total taxes collected are expected to be minor.

#### **10.5.4 Education**

##### **10.5.4.1 Alternatives 1 through 6**

Squadron detachments would not be considered permanently stationed at NAS North Island, and military and civilian/contractor personnel would be unaccompanied. There would be no change in the number of school-aged children in the local municipalities or schools as a result of any alternative in this action. No impact on education is anticipated.

##### **10.5.4.2 No Action Alternative**

Under the No Action Alternative, P-3C aircraft would not transition to P-8A MMA and no change in required personnel would take place. The base personnel figures would remain as existing, and there would be no associated change in dependents of military or contractor/civilian personnel. There would be no impact on education as a result of this Navy action.

### **10.5.5 Impacts on Minority and Low-Income Populations and Environmental Health and Safety Risks to Children**

Consistent with Executive Orders 12898 and 13045, and as discussed in Section 9.5.5, the Navy's policy is to identify disproportionately high and adverse human health or environmental effects of its actions on minority and low-income populations or that pose environmental health and safety risks to children. This analysis focuses on the potential for minority and low-income populations and children to be exposed to projected aircraft noise associated with the various alternatives. All alternatives at NAS North Island involve the same number of squadrons and operational requirements, so they would have identical noise contours.

Tables 10-7, 10-8, and 10-9 provide demographic and economic data for all census tracts wholly or partially within the greater-than-65 dB CNEL noise zones under Alternatives 1 through 6. These demographic and economic data were compared with similar demographic and economic data for San Diego County and the state of California (see Section 9.5.5) to determine whether the proposed action would have disproportionately high and adverse effects on minority and low-income populations or pose environmental health or safety risks to children. Where the minority and low-income populations or number of children within the identified affected area exceeds 50%, or the percentage of minority or low-income populations or children exceeds the comparable percentage of these populations in the community of comparison (i.e., the city or county), the population exposed is considered to receive a disproportionately high and adverse effect or to sustain environmental health or safety risks.

**Table 10-7 Total Persons by Race and Hispanic Origin for all 2000 Census Tracts within or Partially within the Greater-than-65 dB CNEL Noise Zone at NAS North Island under Alternatives 1 through 6 (Periodic Squadron Detachments)**

<b>Census Tract<sup>a</sup></b>	<b>Total Persons</b>	<b>Percent Hispanic</b>	<b>Percent Minority</b>
009901	1,191	4.8%	21.6%
009902	58	6.9%	39.7%
010602	2,787	15.2%	0.5%
010603	768	4.9%	7.7%
010700	1,151	6.7%	13.8%
010800	2,512	4.1%	6.3%
011200	1,082	6.5%	3.0%
<b>San Diego County</b>	<b>2,813,833</b>	<b>26.7%</b>	<b>33.6%</b>
<b>State of California</b>	<b>33,871,648</b>	<b>32.4%</b>	<b>40.6%</b>

Notes:

Shaded numbers represent those census tracts having a higher percentage of minority population than the community of comparison.

<sup>a</sup> Does not include NAS North Island Census Tract.



**Table 10-8 Percent of Population Considered Low Income in Each 2000 Census Tract Within or Partially Within the Greater-than-65 dB CNEL Noise Zone at NAS North Island under Alternatives 1 through 6 (Periodic Squadron Detachments)**

<b>Census Tract<sup>a</sup></b>	<b>Total Population</b>	<b>Percent Considered Low-Income (Below Poverty)</b>
009901	1,191	0.0%
009902	58	-
010602	2,787	11.0%
010603	768	2.2%
010700	1,151	5.7%
010800	2,512	5.7%
011200	1,082	4.0%
<b>San Diego County</b>	<b>2,813,833</b>	<b>12.4%</b>
State of California	33,871,648	14.2%

Source: U.S. Census Bureau 2000.

Note:

<sup>a</sup> Does not include NAS North Island Census Tract.

**Table 10-9 Percent of Population Considered Children in Each 2000 Census Tract Within or Partially Within the Greater- than-65 dB CNEL Noise Zone at NAS North Island under Alternatives 1 through 6 (Periodic Squadron Detachments)**

<b>Census Tract<sup>a</sup></b>	<b>Population</b>	<b>Percent Considered Children (Under 18 years of age)</b>
009901	1,191	0.5%
009902	58	0.0%
010602	2,787	24.4%
010603	768	4.6%
010700	1,151	21.5%
010800	2,512	20.4%
011200	1,082	19.8%
<b>San Diego County</b>	<b>2,813,833</b>	<b>25.6%</b>
State of California	33,871,648	27.2%

Source: U.S. Census Bureau 2000.

Note:

<sup>a</sup> Does not include NAS North Island Census Tract.

#### **10.5.5.1 Minority Populations**

Minority populations are defined by Executive Order 12898 as individuals who are Black/African-American (not of Hispanic origin), Asian or Pacific Islander, American Indian or Alaskan Native, or Hispanic. As shown in Table 10-7 (see also Section 9.5.5), in 2000 these minority populations in San Diego County and the state of California comprised 33.6% and 40.6%

of the populations, respectively. Figure 10-2 shows the locations of census tracts in the vicinity of NAS North Island and their relationship to the modeled projected 2019 noise zones under Alternatives 1 through 6.

With the exception of one census tract (009902), the percentage of minorities in these census tracts surrounding NAS North Island is lower than the county average. Census tract 009902 shows a slightly higher percentage of minority populations than the county. Thus, there is a potential for a disproportionately high and adverse environmental and human health impact on this population. However, further review shows that, in the baseline environment, these census tracts are currently within the greater-than-65 dB CNEL noise zone. In other words, there would be no change between baseline and future noise conditions upon implementation of the proposed action. Therefore, the proposed action would not increase the percentage of minority population within the greater-than-65 dB CNEL noise zone.

#### **10.5.5.2 Low-Income Populations**

The Council on Environmental Quality (1997) defines low-income populations as populations considered by the U.S. Census Bureau to be “below poverty level.” The number of individuals below poverty level was obtained for each census tract wholly or partially within the greater-than-65 dB CNEL noise zone under Alternatives 1 through 6 at NAS North Island. Table 10-8 presents the low-income statistics for census tracts identified in Figure 10-2.

As shown in Table 10-8, no census tracts within the area encompassed by the greater-than-65 dB CNEL noise zone have a higher rate of poverty than San Diego County (community of comparison). For this reason, the proposed action would not have a disproportionately high or adverse environmental or human health impact on low-income populations.

#### **10.5.5.3 Children**

For the purposes of this analysis, children are defined as those individuals under the age of 18 years. These statistics were obtained using 2000 U.S. census data for each census tract wholly or partially within the greater-than-65 dB CNEL noise zone under Alternatives 1 through 6 at NAS North Island. Figure 10-2 shows impacted census tracts and Table 10-9 presents statistics for each census tract.

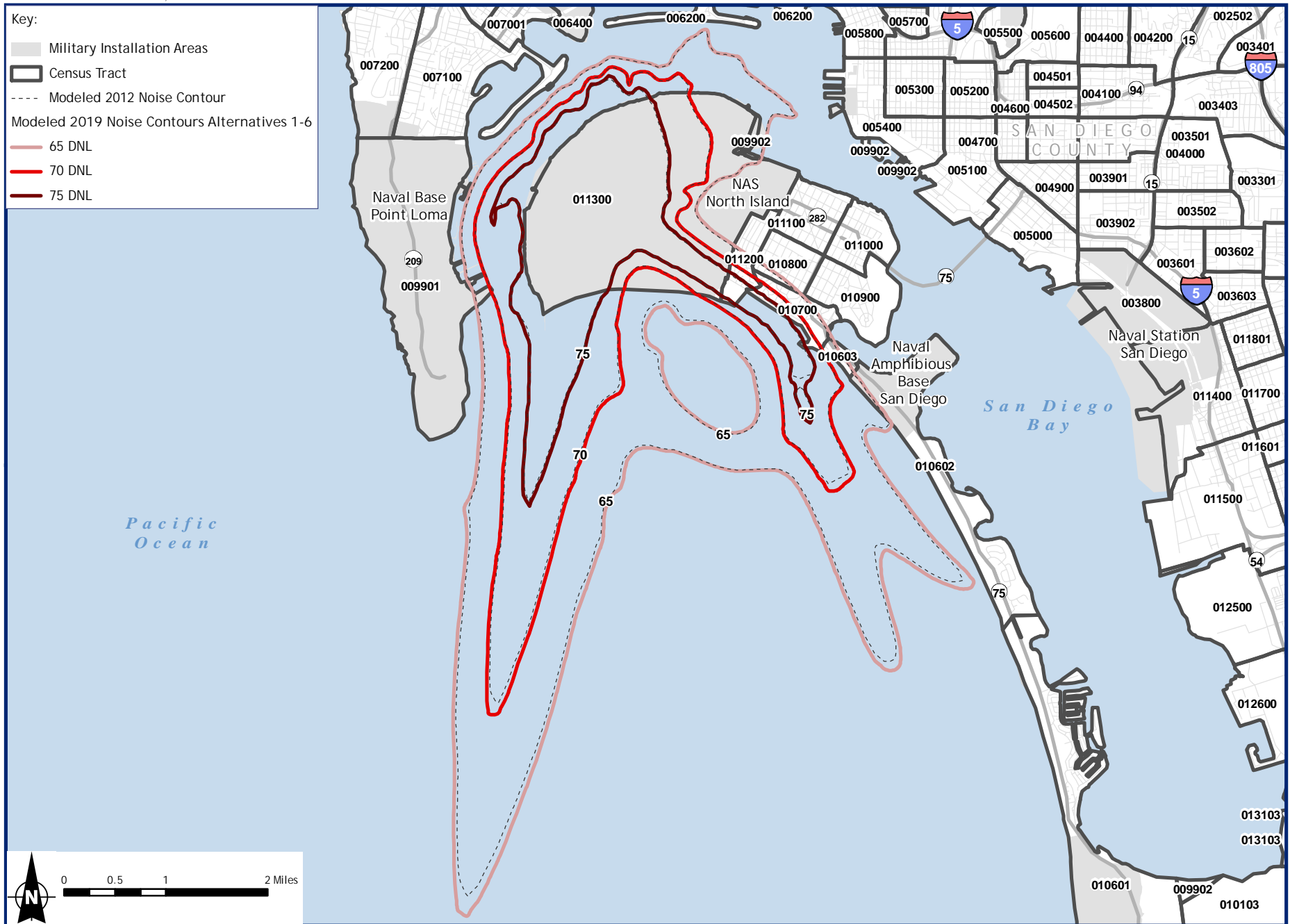


Figure 10-2  
 2000 Census Tracts Wholly or Partially within Modeled 2012 CNEL Noise Contours  
 and 2019 CNEL Noise Contours Projected Under Alternatives 1-6  
 NAS North Island, California

As shown in Table 10-9, there are no census tracts within the greater-than-65 dB CNEL zone with a higher number of children than San Diego County (community of comparison). For this reason, the proposed action would not have a disproportionately high or adverse environmental health or safety risk on children.

## **10.6 Infrastructure and Utilities**

As noted in Chapter 9, infrastructure and utilities would not be affected by the proposed action and so are not discussed in this EIS.

## **10.7 Community Services**

As noted in Chapter 9, community services would not be affected by the proposed action and so are not discussed in this EIS.

## **10.8 Transportation**

As noted in Chapter 9, transportation would not be affected by the proposed action and so is not discussed in this EIS.

## **10.9 Topography and Soils**

As noted in Chapter 9, because there would be no construction at NAS North Island, topography and soils would not be affected by the proposed action and so are not discussed in this EIS.

## **10.10 Water Resources and Wetlands**

As noted in Chapter 9, water resources and wetlands would not be affected by the proposed action and so are not discussed in this EIS.

## **10.11 Biological Resources**

### **10.11.1 Vegetation**

As noted in Chapter 9, vegetation would not be affected by the proposed action and so is not discussed in this EIS.

### **10.11.2 Wildlife**

Wildlife at NAS North Island would not be directly affected by the proposed action because no new construction would be required to support periodic detachments of P-8A MMA. The following operational factors associated with the proposed action at NAS North Island were considered in evaluating the potential for adverse effects on wildlife:

- There would be a projected 1% decrease in the annual number of flight operations as per the P-8A MMA flight syllabus;
- There would be no change in the type, location, or current ratio of daytime and nighttime operations;
- There would be a slight (1%) decrease in land area within the greater-than-65 dB CNEL noise zone;
- While the P-8A MMA is approximately 1 dB louder than the P-3C during takeoff, the P-8A MMA climbs faster on departure than does the P-3C, resulting in a comparable noise impact on the ground; and
- The P-8A MMA is approximately 2 dB louder than the P-3C during landing, causing a slightly higher, yet still comparable, noise impact on the ground.

These operational factors associated with the proposed action would have no adverse effects on wildlife.

#### **10.11.2.1 Migratory Birds**

As noted in Section 9.11.2.1, military readiness activities are exempt from the take prohibitions of the Migratory Bird Treaty Act (MBTA), provided they would not result in a significant adverse effect on a population of migratory bird species. Regardless, as noted above in the discussion of wildlife impacts, populations of migratory birds would not be significantly affected by the proposed action at NAS North Island.

#### **10.11.2.2 Bird-Aircraft Strike Hazard**

No aspect of the proposed action would create attractants with the potential to increase the concentration of birds in the vicinity of the airfield. Therefore, considering the decrease in annual operations and utilization of existing flight tracks, the risk of a bird-aircraft strike hazard would not increase at NAS North Island.

### **10.11.3 Threatened and Endangered Species**

As discussed in Section 9.11.3, portions of NAS North Island support nesting and/or foraging populations of the federally listed California least tern, western snowy plover, and California brown pelican. Habitat for these species would not be directly affected by the proposed action because no new construction is required to support periodic detachments of P-8A MMA. Noise associated with replacement of P-3C aircraft at NAS North Island with P-8A MMA would not disturb nesting or foraging activities of federally listed bird species on the station because the number of annual aircraft operations and noise exposure would decrease while the type and location of operations would remain the same. The Navy has determined that implementation of the proposed action would have no effect on the California least tern, western snowy plover, and California brown pelican.

### **Other Species of Concern**

Other species of concern on or in the immediate vicinity of NAS North Island are the osprey, sharp-shinned hawk, Cooper's hawk, burrowing owl, and San Diego black-tailed jackrabbit. Based on factors discussed above, implementation of the proposed action would have no effect on these other species of concern.

### **10.11.4 Marine Mammals**

As discussed in Section 9.11.3.2, three species protected under the Marine Mammal Protection Act (MMPA) are known to occur in San Diego Bay: coastal bottlenose dolphin, California sea lion, and the Pacific harbor seal. The California sea lion and Pacific harbor seal are occasionally observed on NAS North Island coastal beaches. With no new construction or increase in operations or noise, implementation of the proposed action would have no effect on these marine mammals. Consequently, the Navy has determined the proposed action would not result in reasonably foreseeable "takes" of a marine mammal species by harassment or injury or mortality as defined under the MMPA.

## **10.12 Cultural Resources**

### **10.12.1 Architectural Resources**

Effects on historic resources eligible or potentially eligible for listing in the National Register for Historic Places (NRHP) were evaluated based on the *Criteria of Effect and Adverse*

*Effect*, established by the Advisory Council for Historic Preservation (ACHP) (36 CFR 800.9).

These criteria are listed in Table 10-10.

**Table 10-10 Criteria for Adverse Effects on Historic Properties**

<b>Criteria for Adverse Effects</b>
<p>“An adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property’s location, setting, materials, workmanship, feeling, or association. Consideration shall be given to all qualifying characteristics of a historic property, including those that may have been identified subsequent to the original evaluation of the property’s eligibility for the National Register. Adverse effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance or be cumulative” (36 CFR 800.5[a][1]).</p>
<b>Examples of Adverse Effects</b>
<p>“Adverse effects on historic properties include, but are not limited to:</p> <ol style="list-style-type: none"><li>1. Physical destruction of or damage to all or part of the property;</li><li>2. Alteration of a property, including restoration, rehabilitation, repair, maintenance, stabilization, hazardous material remediation and provision of handicapped access, that is not consistent with the Secretary’s Standards for the Treatment of Historic Properties (36 CFR Part 68) and applicable guidelines;</li><li>3. Removal of the property from its historic location;</li><li>4. Change of the character of the property’s use or of physical features within the property’s setting that contribute to its historic significance;</li><li>5. Introduction of visual, atmospheric or audible elements that diminish the integrity of the property’s significant historic features;</li><li>6. Neglect of a property which causes its deterioration, except where such neglect and deterioration are recognized qualities of a property of religious and cultural significance to an Indian tribe or Native Hawaiian organization;</li><li>7. Transfer, lease, or sale of property out of Federal ownership or control without adequate and legally enforceable restrictions or conditions to ensure long-term preservation of the property’s historic significance” (36 CFR 800.5[a][2]).</li></ol>

As discussed in Section 9.12.1, 82 buildings and structures within two historic districts at NAS North Island have been determined to be eligible for listing on the NRHP. None of these NRHP-eligible buildings would be physically altered because no new construction is proposed at NAS North Island.

With respect to the potential for aircraft noise effects on structural components of historical buildings, Sutherland (1989) studied effects of low-altitude, high-speed aircraft on structures. This study showed there is little probability of structural damage occurring as a result of such operations. In addition, there are no historical data in the *Integrated Cultural Resources Management Plan for Naval Air Station North Island* documenting damage to historic structures caused by noise vibrations from aircraft operations. Based on the Sutherland (1989) study and past experience, vibration-related effects on historic properties would not be expected at the station as a result of the aircraft replacement.

Therefore, in accordance with the Advisory Council's regulations concerning the criteria for adverse effects, the Navy has concluded the proposed action would have no effect on historic resources.

#### **10.12.2 Archaeological Resources**

Because no new construction or other ground-disturbing activities would occur, the proposed action at NAS North Island would have no effect on archaeological resources.

#### **10.13 Hazardous Materials and Waste Management**

As noted in Chapter 9, there would be no increase in hazardous materials use; therefore, there would be no impact from the proposed action on hazardous materials and waste management.



## **11 Cumulative Impacts**

The Council on Environmental Quality (CEQ) regulations for implementing the National Environmental Policy Act (NEPA) define cumulative impacts as “the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what other agency (federal or non-federal) or person undertakes such other actions” (40 Code of Federal Regulations [CFR] 1508.7). Cumulative impacts can result from individually minor but collectively significant actions by various agencies (federal, state, and local) or individuals that take place over time. Accordingly, a cumulative impacts analysis must identify and define the scope of other actions and their relationship with the proposed action or its alternatives if there is an overlap in space and time.

Cumulative effects are most likely to occur when a proposed action is related to actions that could occur in the same or overlapping geographic location or at the same or a similar time. The following questions were considered in identifying the potential for cumulative impacts:

- Would the proposed action and alternatives affect or interact with the same resources that have been or would be affected by recent past, present, or reasonably foreseeable actions?
- Would the proposed action and alternatives affect or be affected by the impacts of the other action?
- If an interrelationship exists between the proposed action and alternatives and other recent past, present, or reasonably foreseeable actions, are there any potential significant impacts not identified when the proposed action and alternatives are considered alone?

The time frame for cumulative effects would start in 2011 and continue to 2019, when the proposed action will have been fully implemented. This is the same time frame evaluated in the environmental consequences sections. As a result, the environmental consequences sections have already incorporated cumulative impacts for proposed Navy aircraft actions, including other aircraft and personnel loading changes scheduled to occur at existing P-3C homebases before or concurrent with the introduction of the P-8A MMA.

In addition to the personnel loading changes at each base directly attributable to the P-3C and P-8A MMA transition, other military activities at these installations will be experiencing changes. Activities involving a transition or change between the baseline year of 2011 and the

end state of the P-8A MMA action in 2019 may have a personnel loading change associated with them. Information on personnel loading for these activities was gathered and incorporated into the estimated P-8A MMA action numbers to arrive at a total base-wide personnel loading estimate. The P-8A MMA action, along with the personnel changes associated with these other activities, are presented as the “Total End State” in Table 2-5.

For the purposes of this analysis, public documents prepared by federal, state, and local agencies were the primary sources of information for identifying reasonably foreseeable actions. Government agencies were also contacted to determine proposed development and transportation projects that could pose cumulative impacts when considered with the proposed action. The focus of this cumulative impact analysis was on:

- Actions occurring within the alternative homebasing installations, including NAS Jacksonville, NAS Whidbey Island, NAS North Island, and MCBH Kaneohe Bay, and
- Actions occurring within the local communities surrounding the alternative homebasing installations.

Cumulative impacts are identified by homebase location in the following sections. Short- and long- term direct and indirect impacts are presented for the facilities and functions to support homebasing of the P-8A MMA fleet squadrons and the FRS at established maritime patrol homebases. If the proposed action does not result in a direct or indirect impact to a resource area, then no further analysis of potential cumulative effects is necessary.

## **11.1 NAS Jacksonville**

### **11.1.1 Installation Projects**

The Navy has evaluated the following actions at NAS Jacksonville for potential cumulative impacts of the proposed P-8A MMA replacement action:

- Base Closure and Realignment Commission (BRAC) transfer of P-3C aircraft squadrons to NAS Jacksonville from NAS Brunswick; and
- Homebasing MH-60R helicopters at NAS Jacksonville and NAS Mayport.

#### **BRAC Transfer of P-3C Aircraft Squadrons**

NAS Jacksonville will receive three additional P-3C squadrons from NAS Brunswick, Maine, as part of the BRAC 2005 recommendations. A total of 27 assigned P-3C aircraft will

transition to NAS Jacksonville over a period of four years (i.e., between 2008 and 2012). To support these additional aircraft, the Navy is constructing a new 277,000 square foot hangar and 122,000 square foot parking apron in the southern portion of the airfield. A new parking area for privately owned vehicles (POVs) is also being constructed adjacent to the new hangar.

The airfield operations and related impacts due to the introduction of three additional P-3C squadrons and one P-3C Update squadron at NAS Jacksonville have been included in the baseline data.

Construction of the new facilities at NAS Jacksonville to support the P-3C transition and the P-8A MMA replacement would cause short-term and minor impacts on air quality. Noise levels in the vicinity of the construction sites would also increase, which could indirectly affect resident wildlife species. However, these temporary impacts would occur only during the active construction periods. Considering that the new P-3C facilities are scheduled to be completed by 2009 and the P-8A MMA facilities construction would not be initiated before 2009, the construction activities for both activities would not coincide. As a result, any impacts on air quality, noise, and wildlife would have dissipated by the time P-8A MMA facilities construction begins.

The P-3C aircraft will be retired in a phased cycle commensurate with the introduction of the replacement P-8A MMA at NAS Jacksonville. Therefore, no long-term cumulative impacts from the P-3C transition and P-8A MMA replacement would occur.

### **Homebasing MH-60R Helicopters**

The Navy recently implemented its proposed basing of three squadrons of MH-60R helicopters at NAS Jacksonville. The Navy prepared an Environmental Assessment (EA) to address the primary environmental and socioeconomic issues associated with the proposed action to support the homebasing and operations of new MH-60S and MH-60R helicopters on the East Coast of the United States. A Finding of No Significant Impact (FONSI) was signed for this action on May 17, 2002.

The MH-60R basing resulted in an increase of four helicopters at NAS Jacksonville. No new construction or changes to the helicopter flight tracks were required to base the helicopters at the station. In addition, there was no increase in the overall noise contours and no change in designated accident potential zones (APZs) at the station. Based on these factors, the MH-60R

homebasing and P-8A MMA replacement action would have no adverse cumulative effects on noise or biological resources.

Helicopter operations at the station increased by approximately 10%, which caused a slight increase in air emissions. Considering the decrease in mobile-source air emissions from P-8A MMA operations at NAS Jacksonville under all relocation alternatives, the slight increase in air emissions from the new MH-60R helicopters would have no cumulative effect on air quality.

### **11.1.2 Regional Projects**

To determine projects that should be included in the cumulative impacts analysis, the Navy interviewed the City of Jacksonville Planning and Development, Community Planning Division (Lukacovic 2008) and reviewed the following community planning documents:

- City of Jacksonville 2010 Comprehensive Plan, May 2008 (Future Land Use Element, Transportation Element, and Capital Improvements Element)
- City of Jacksonville Evaluation and Appraisal Report 2010 Comprehensive Plan, September 2007
- Better Jacksonville Plan
- Northwest Jacksonville Vision Plan
- Southwest Jacksonville Vision Plan
- Florida Department of Transportation, District Two Construction, Duval County Projects
- First Coast Metropolitan Planning Organization (MPO) Long Range Transportation Plan
- First Coast MPO Transportation Improvement Program, Fiscal Year 2008/09 – 2012/13

Based on discussions with the planning division and review of the documents listed above, the following projects were evaluated for potential cumulative impacts with the proposed P-8A MMA replacement action:

- Collins Road (construction of a three-lane urban section from Blanding Boulevard to U.S. Highway 17 [Roosevelt Road]), and
- Interstate 295 (I-295)/Collins Road Overpass.

Reconstruction of the Collins Road segment between Blanding Boulevard and U.S. Highway 17 is currently in the design phase and is scheduled for completion in fiscal year (FY) 2010/2011 (First Coast Metropolitan Planning Organization 2008). As part of the reconstruction of Collins Road, the City of Jacksonville will construct a new Collins Road overpass at I-295. A small portion of this construction would occur within the defined geographic boundary surrounding NAS Jacksonville.

### **11.1.3 Cumulative Impact Analysis**

#### **11.1.3.1 Noise**

##### **Description of Geographic Study Area**

The geographic boundary for the cumulative noise impacts analysis for NAS Jacksonville includes the installation and the airport notice zone for the installation defined in the revised City of Jacksonville Part 10 Airport District Zoning Ordinance (Airport District Zoning Ordinance). This ordinance regulates airports and their adjacent lands and provides an established and recognized regional boundary for analysis of cumulative impacts. As defined by the Airport District Zoning Ordinance, an airport notice zone encompasses the outermost boundary of an airport as defined by noise zones, airspace height and hazard zones, clear zones, runway protection zones, and APZs. The ordinance requires the execution of a formal acknowledgement of the airport notice zone during the sale, transfer, or greater-than-30-day lease of property.

The geographic boundary also encompasses the additional area that would be included in the greater-than-65 dB DNL noise contour under the proposed action. Figure 4-1 (in Section 4) shows the boundary as it would appear under Alternative 1.

##### **Cumulative Impact Assessment**

The projected noise contours for the 65 dB DNL contours increase compared with the baseline contours under all alternatives. However, the projected noise contours for the loudest noise exposure—>75 dB DNL—remained almost entirely within the base boundaries. Due to the increase in the 65 dB DNL contour and projected population growth, there would be significant noise impacts for all of the alternatives at NAS Jacksonville when compared with baseline conditions.

Construction on Collins Road and I-295 would result in temporary noise impacts in the immediate vicinity of construction areas. However, these transportation projects would not result in any cumulative impacts with the proposed P-8A MMA replacement action. P-8A MMA would not begin operating at NAS Jacksonville until after 2011, after the scheduled completion date of the Collins Road reconstruction. Construction of the new training facility and associated POV parking area at NAS Jacksonville could take place concurrently with the Collins Road reconstruction. However, because the proposed construction area at NAS Jacksonville is more than 2 miles away from Collins Road and because construction at the installation would occur only during daylight hours, there would be no cumulative noise impacts.

#### **11.1.3.2 Land Use**

##### **Description of Geographic Study Area**

The study area for land use is the same as that described for noise.

##### **Cumulative Impact Assessment**

The projected noise zones under each of the alternatives would extend over land not previously contained within the modeled 2011 noise zones for NAS Jacksonville. Therefore, the Navy will consider the need to update the NAS Jacksonville AICUZ Report.

Future development is guided by the policies set forth in the City of Jacksonville 2010 Comprehensive Plan and the city's Airport District Zoning Ordinance. The 2010 Comprehensive Plan recognizes the AICUZ concepts for NAS Jacksonville and accordingly recommends compatible development near the installation in order to protect the safety and welfare of property owners, residents, and businesses in the area (City of Jacksonville May 2007). The amended Airport District Zoning Ordinance regulates land uses adjacent to military and civilian airports and establishes noise zones and APZs that are intended to conform to the current noise zones and APZs developed by military installations within the city. Proposed future land uses in the immediate vicinity of NAS Jacksonville generally are consistent with the compatibility guidance outlined in these policies. The transportation projects identified in Section 11.1.2 would not have cumulative impacts on land use.

### **11.1.3.3 Socioeconomics**

#### **Description of Geographic Study Area**

The study area for socioeconomics includes Duval County.

#### **Cumulative Impact Assessment**

At NAS Jacksonville, there would be a combined loss of an additional 283 personnel associated with changes in other activities at the installation. The cumulative impact experienced at NAS Jacksonville would be the sum of the P-8A MMA action plus these other activities. Specifically, there will be a cumulative loss in personnel under all alternatives at NAS Jacksonville of between 1,822 (under Alternative 1) to a maximum of 2,338 (under Alternatives 4 and 6). Based on the projected growth rate of the city of Jacksonville, the cumulative loss of personnel at NAS Jacksonville would have a minor effect on the local population and economy.

The proposed transportation projects would not have a cumulative impact on socioeconomics since the P-8A MMA would result in a decrease of military personnel and a corresponding decrease in military-generated vehicle trips on local roadways.

### **11.1.3.4 Storm Water**

#### **Description of Geographic Study Area**

The study area for storm water is the same as that described for noise.

#### **Cumulative Impact Assessment**

Construction of the facilities to support the P-8A MMA replacement at NAS Jacksonville would disturb approximately 3 acres under Alternatives 4 and 6 and 5 acres under Alternatives 1, 2, 3, and 5. Storm water runoff from the construction site could potentially affect water quality in the lower St. Johns River basin through the introduction of sediments, particulates, and various constituents. A construction National Pollutant Discharge Elimination System (NPDES) storm water permit would be obtained from the Florida Department of Environmental Protection through their storm water permitting program because more than 1 acre would be disturbed during construction under all replacement alternatives. Under the permit, the Navy would submit a site-specific Storm Water Pollution Prevention Plan (SWPPP) for new discharges that would include a site plan for managing storm water runoff and that describes the best management prac-

tices (BMPs) to be implemented to eliminate or reduce erosion, sedimentation, and storm water pollutants. Examples of storm water BMPs that may be used include retention ponds, temporary sediment basins, silt fencing, and berms. With proper implementation of the SWPPP, impacts on water quality from erosion and off-site sedimentation would be negligible.

The new construction to support the P-8A MMA would create approximately 2.1 acres of new impervious surface under Alternatives 4 and 6 and 3.8 acres under Alternatives 1, 2, 3, and 5. This surface would, on the average, generate an additional 2.28 million gallons of runoff per year under Alternatives 4 and 6 and 4.13 million gallons of runoff per year under Alternatives 1, 2, 3, and 5. Once the facilities are constructed, storm water from the new impervious surface would be directed to a new storm water conveyance system or the existing storm water conveyance system via sheet flow or grass-lined swales for discharge to the lower St. Johns River.

Although the proposed action and the transportation projects would result in the generation of additional storm water runoff, the mitigation associated with these projects would reduce the amount of storm water to pre-project conditions. As a result, no cumulative impacts from storm water would occur.

## **11.2 Whidbey Island**

### **11.2.1 Installation Projects**

The Navy has identified the following actions at NAS Whidbey Island for potential cumulative impacts with the proposed P-8A MMA replacement action:

- Replacement of EA-6B aircraft with EA-18G aircraft at NAS Whidbey Island;
- Replacement of the P-3C Update<sup>1</sup> aircraft with a follow-on aircraft, still to be determined, at NAS Whidbey Island;
- Replacement of the C-9 aircraft with the C-40 aircraft at NAS Whidbey Island;
- An aviation fuel pipeline (Seaplane Base to Ault Field MILCON project P-188);
- Crescent Harbor Salt Marsh Restoration;
- Northwest Training Range Complex Environmental Impact Statement/Overseas Environmental Impact Statement; and
- Construction of a breakwater structure to protect the fuel pier at the NAS Whidbey Island Seaplane Base.

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<sup>1</sup> The P-3C Update aircraft are not part of the P-8A MMA replacement action.



### **Replacement of EA-6B Aircraft with EA-18G Aircraft**

The Navy is currently implementing the replacement of EA-6B aircraft with EA-18G aircraft at NAS Whidbey Island. The Navy prepared an EA in support of this action, and a FONSI was signed in 2004.

Replacement of the EA-6B with the EA-18G began in 2008 and is scheduled to be completed by 2013. The replacement process will result in an overall decrease in the number of aircraft and associated personnel at NAS Whidbey Island. A total of 57 EA-18G aircraft will replace the existing 72 EA-6B aircraft, resulting in a decrease of 15 aircraft stationed at NAS Whidbey Island. Modifications to existing facilities and some new construction will be required to support the EA-18G aircraft. New construction would be located on existing paved areas and therefore would have no impact on natural resources at NAS Whidbey Island. Operation of the EA-18G will result in a decrease in total annual mobile source air emissions at the station as well as a decrease in the area exposed to aircraft noise. Based on these factors, the EA-18G at NAS Whidbey Island would have no adverse cumulative effects on air quality, noise, or biological resources.

### **Replacement of the P-3C Update Aircraft with a Follow-On Aircraft**

The P-3C Update aircraft is anticipated to be replaced by a yet-to-be-determined aircraft at NAS Whidbey Island. The P-3C Update replacement action has not been fully developed at this time; therefore, cumulative impacts cannot be addressed. Appropriate NEPA documentation will be prepared as the replacement action is further developed.

### **Replacement of the C-9 Aircraft with the C-40 Aircraft**

The C-9 aircraft is anticipated to be replaced by the C-40 at NAS Whidbey Island. It is expected that the current four C-9 aircraft at the station will be replaced by an equal number of C-40 aircraft. The C-9 replacement action has not been fully developed at this time; therefore, cumulative impacts cannot be addressed. Appropriate NEPA documentation will be prepared as the replacement action is further developed.

### **Aviation Fuel Pipeline**

As currently planned, this project would construct a new 12-inch diameter underground fuel pipeline that would replace the existing 4-inch and 8-inch existing underground fuel pipe-

lines. A portion of the route would change so that less of the route was along the right-of-way of a state highway (SR-20) and more would be on Navy property. An EA is being developed for this project and has a scheduled completion date of October 2008. Additional impervious surfaces, if any, would appear to be negligible. It is not anticipated that this project would contribute to any cumulative impacts associated with the homebasing of the P-8A MMA at NAS Whidbey Island.

### **Crescent Harbor Salt Marsh Restoration**

The Skagit River System Cooperative, in coordination with the NAS Whidbey Island Environmental Affairs Department, plans to restore 206 acres of juvenile salmon-rearing habitat and other tidal wetland functions to the Crescent Harbor salt marsh located on the Seaplane Base (Mosher 2008). Restoration activities at the site would include creating access points or expanding existing access points to increase tidal circulation and fish access to the salt marsh. The design and construction phases of this project have been funded. Pending approval of the required permits, construction at the site is anticipated to begin in summer 2008 and continue during summer 2009 (Skagit River System Cooperative n.d.) A Biological Assessment conducted by the Navy in support of the planned restoration actions concluded that the project may affect, but is not likely to adversely affect, bull trout during restoration activities (Mosher 2008).

Construction projects associated with the Crescent Harbor Salt Marsh Restoration will be completed prior to the start of construction associated with the P-8A MMA replacement action at NAS Whidbey Island. Therefore, there would be no cumulative impacts on water quality or marine species in Crescent Harbor as a result of construction projects associated with the two actions. However, there would be a positive cumulative impact on water quality and wildlife in the harbor as a result of the Navy's proposed wetland rehabilitation activities at a site located just east of the Skagit River System Cooperative site (see Section 6.10.5 for details on the Navy's proposed mitigation).

### **Northwest Training Range Complex**

The Navy is currently preparing an Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS) to assess the potential environmental effects associated with current and proposed training activities, proposed force structure changes (i.e., new weap-

ons systems and platforms), and proposed range enhancements within the Northwest Training Range Complex. The Northwest Training Range Complex (NTRC) consists of ocean operating areas, special use airspace, and training land areas extending west to 250 nautical miles (NM) beyond the coast of northern California, Oregon, and Washington and east to the Washington/Idaho border. The NTRC includes Military Operating Areas and training areas in the vicinity of NAS Whidbey Island. The Draft EIS/OEIS will analyze three alternatives: a No Action Alternative – Current Training Activities; Alternative 1 – Increase Training Activities and Accommodate Force Structure Changes; and Alternative 2 – Increase Training Activities, Accommodate Force Structure Changes, and Implement Range Enhancements. Alternative 2 is the preferred alternative.

Potential environmental effects associated with the proposed action described above that could potentially result in cumulative impacts with the P-8A MMA replacement action include impacts on threatened and endangered species and cultural resources.

### **Construction of a Breakwater Structure at the Seaplane Base**

This project would replace a deteriorating finger pier located at the end of a riprap mole extending from the Crescent Harbor shoreline with a partial-depth sheet pile breakwater (preferred alternative). Construction of a breakwater would protect the Navy's fuel pier from wave action and sedimentation following demolition of the existing finger pier (Berger/Abam Engineers, Inc. 2008). The Navy developed a Fuel Pier Protection Study, which was completed in March 2008, to analyze existing conditions at the fuel pier and four alternatives for constructing a new breakwater structure.

Potential impacts resulting from the demolition of the existing finger pier and construction of a partial-depth sheet pile breakwater would occur in the limited area in and around Crescent Harbor. No cumulative impacts would result with this project from construction at NAS Whidbey Island to support the P-8A MMA replacement action because storm water generated by new construction at the installation would be discharged into Dugualla Bay. Cumulative impacts on water quality could potentially result during restoration activities at the proposed mitigation site north of Crescent Harbor; however, these impacts would be minor and temporary.

### **11.2.2 Regional Projects**

As part of the cumulative impacts analysis, the Navy interviewed City of Oak Harbor Planning Department and Washington State Department of Transportation personnel and reviewed the following community planning documents:

- City of Oak Harbor Comprehensive Plan, February 2007; and
- City of Oak Harbor Capital Improvement Plan 2007-2012.

Based on interviews and review of the documents listed above, the Navy evaluated the following projects within the geographic boundary surrounding NAS Whidbey Island for potential cumulative impacts of the proposed P-8A MMA replacement action:

- Heller Road widening,
- Washington State Route (S.R.) 20 widening, and
- A 13-lot housing development on North Whidbey (on Koontz Road off of Troxell Road).

Heller Road is scheduled to be widened within the six-year planning horizon. Currently this is an unfunded project; funding for city road improvements is allotted two years in advance of implementation (Kamak 2008). Once the project is funded, the city will conduct the appropriate environmental studies to determine any potential environmental impacts. No determination of cumulative impacts with the P-8A MMA replacement action can be made at this time.

The Washington State Department of Transportation will widen approximately 5 miles of S.R. 20 from two to four lanes between S.R. 56 (Memorial Highway) and Interstate 5 in Burlington. Construction is scheduled to be completed in fall 2009; therefore, the road widening would not result in any cumulative impacts with the P-8A MMA replacement action at NAS Whidbey Island (Washington State Department of Transportation 2008).

Upon preliminary approval from the Island County Planning and Community Development department, the proposed 37.8-acre housing development project would have up to five years to install infrastructure, e.g., roads, waterlines, etc. The construction schedule is up to the developer but could continue into 2010 (Island County Planning and Community Development 2008). With the five-year development timeframe, this project could have some overlap with the proposed action and was considered in the cumulative impacts analysis.

### **11.2.3 Cumulative Impact Analysis**

#### **11.2.3.1 Socioeconomics**

##### **Description of Geographic Study Area**

The geographic boundary for cumulative impacts assessment encompasses the city limits of Oak Harbor as well as the city's designated Urban Growth Boundary, where most of the growth in the region is projected to occur to the year 2025.

##### **Cumulative Impact Assessment**

Proposed projects at NAS Whidbey Island would result in slight changes to personnel numbers, including both an increase and a reduction in personnel. Implementing Alternative 1 would result in the largest personnel loss—a cumulative loss of 608 personnel—and implementing Alternative 2 would result in the largest personnel gain—a cumulative gain of 371 personnel. Thus, the personnel changes associated with the P-8A MMA replacement, combined with other activities at NAS Whidbey Island, would have a negligible cumulative effect on the local economy in Island County.

#### **11.2.3.2 Storm Water**

##### **Description of Geographic Study Area**

The geographic boundary for cumulative impacts assessment encompasses the city of Oak Harbor and part of Island County from Oak Harbor north to Deception Pass State Park. The boundary includes the city limits of Oak Harbor as well as the city's designated Urban Growth Boundary, where most of the growth in the region is projected to occur up to 2025. The northern part of the boundary includes Dugualla Lagoon, the receiving water body for storm water discharges from the proposed new construction at NAS Whidbey Island.

##### **Cumulative Impact Assessment**

An NPDES storm water permit would be obtained from the Washington State Department of Ecology because construction of the proposed action would disturb more than 1 acre under all alternatives. Under the permit, the Navy (NAS Whidbey Island) would submit a site-specific Storm Water Management Plan for new discharges that would include a site plan for

managing storm water runoff and describe the BMPs to be implemented, including grass swales, silt fences, and berms. With proper implementation of the Storm Water Management Plan, impacts on water quality from erosion and off-site sedimentation during construction would be minor.

The proposed infrastructure development would increase storm water runoff from Ault Field. The proposed action incorporates storm water mitigation measures, including removal of existing impervious surfaces on the base and, under Alternatives 2, 3, 4, and 6, adding a storm water detention basin. With implementation of the proposed mitigation measures, the amount of storm water discharged to Dugualla Lagoon would be the same as current conditions or would decrease.

Any additional projects that could also impact storm water would also be required to implement mitigation. For example, the proposed housing development would use bio-filtration swales, level-spreaders, and a detention pond to handle runoff from the development. County standards require that runoff created by the development be handled on the subject parcel (post-development rates are not to exceed pre-development rates) and not impact downstream/upstream properties (Island County Planning and Community Development 2008). Therefore, as a result of mitigation, no cumulative impacts from any of the proposed projects would be expected.

#### **11.2.3.3 Wetlands**

##### **Description of Geographic Study Area**

The study area for wetlands is the same as that described for storm water.

##### **Cumulative Impact Assessment**

The total wetland loss at NAS Whidbey Island as a result of each of the proposed construction projects under all alternatives are estimated at 0.23 acres (Alternatives 1 and 5), 2.14 acres (Alternative 6), 2.46 acres (Alternative 3), 6.74 acres (Alternative 4), and 6.76 acres (Alternative 2). Because complete wetland avoidance would not be feasible under Alternatives 1 through 6, a Clean Water Act (CWA) Section 404 permit would be obtained from the USACE and a Section 401 permit from the Washington State Department of Ecology if any of these alternatives are selected. These permits regulate the discharge of dredged and fill materials into

waters of the United States, including wetlands. Compensation would be required for long-term impacts resulting from lost wetland acreage that cannot be avoided or minimized. The Washington State Department of Ecology, the U.S. Army Corps of Engineers (USACE), and the U.S. Environmental Protection Agency (EPA) have developed guidelines and acre-for-acre replacement mitigation ratios. As a result of mitigation, no cumulative impacts with any of the proposed projects would be expected.

#### **11.2.3.4 Threatened/Endangered Species**

##### **Description of Geographic Study Area**

The study area for threatened/endangered species is NAS Whidbey Island and the adjacent marine waters (Puget Sound, the Strait of Juan de Fuca, Dugallia Lagoon, and Crescent Harbor).

##### **Cumulative Impact Assessment**

Under the ESA, cumulative impacts are defined as the effects of future state or private activities that are reasonably certain to occur within the action area and are subject to Section 7 consultation. As a result, the Navy has evaluated the potential cumulative effects on threatened and endangered species of the Heller Road widening, the Washington S.R. 20 widening, and the 13-lot housing development on North Whidbey (on Koontz Road off of Troxell Road).

To identify any cumulative impacts on threatened and endangered species, the impacts of the proposed action first need to be evaluated. The Navy determined that the proposed action would have no effect on the humpback whale, southern resident killer whale, the Steller sea lion, or the leatherback sea turtle. As a result, there would be no cumulative impacts on these species. The proposed action may affect, although it is not likely to adversely affect, the marbled murrelet, Puget Sound chinook salmon, Puget Sound steelhead, and bull trout or their respective designated critical habitats (EDAW, Inc. 2008). Based on this analysis of the project impacts on salmonid rearing and foraging habitat, the project may affect, but is not likely to adversely affect, essential fish habitat (EFH) in the project area.

Furthermore, the potential effect of the proposed improvements to water quality and foraging habitat in Crescent Bay and Crescent Bay Marsh from wetland mitigation/stream restoration and marsh restoration would be beneficial to both Puget Sound bull trout and Puget Sound chinook salmon (EDAW, Inc. 2008). The Navy has conferred with the U.S. Fish and Wildlife

Service (USFWS) and the National Oceanic and Atmospheric Administration (NOAA) Fisheries regarding the storm water management options and determination of effects.

Although a state project, a NEPA EIS and supplemental EA were prepared for the S.R. 20 widening project because of the involvement of the Federal Highway Authority. Because of the involvement of a federal agency, this project has already consulted with the USFWS and is not evaluated under the ESA definition of cumulative impacts.

The housing development was subject to environmental analysis under the Washington State Environmental Policy Act. As part of this process, effects on threatened and endangered species were analyzed. The housing development would have no effect on threatened and endangered species; therefore, no cumulative impacts on threatened and endangered species would occur.

### **Northwest Training Range Complex**

Proposed changes in training activities, force structure changes, and range enhancements at the NTRC may affect threatened or endangered species but would have no effect on designated critical habitat. The proposed P-8A MMA replacement action may affect, but is not likely to adversely affect, marine threatened and endangered species in the vicinity of NAS Whidbey Island due to changes in water quality related to storm water discharge. Any impacts on threatened and endangered species are expected to be minor and highly localized because on-site BMPs to reduce storm water runoff and dispersion of storm water in the marine environment would be implemented. Based on this analysis, there would be no cumulative impacts on populations of threatened and endangered species.

#### **11.2.3.5 Cultural Resources**

##### **Description of Geographic Study Area**

The study area for cultural resources is the same as that described for socioeconomics.

##### **Cumulative Impact Assessment**

**Replacement of EA-6B Aircraft with EA-18G Aircraft.** The Navy is currently implementing the replacement of EA-6B aircraft with EA-18G aircraft at NAS Whidbey Island. The Navy prepared an EA in support of this action, and a FONSI was signed in 2004.



Replacement of the EA-6B with the EA-18G began in 2008 and is scheduled to be completed by 2013. The replacement will have an adverse effect on an historic property, Hangar 5. The State Historic Preservation Officer (SHPO) has been consulted and has concurred with the installation on the nature of the impacts; a portion of the structure will be left unaltered per their recommendation.

**Northwest Training Range Complex.** Under the proposed action at the NTRC, identification of cultural sites prior to exercises and avoidance of known cultural sites would result in negligible to minor adverse effects on archaeological resources. Because of proposed increases in land detonation activities under Alternative 2, implementation of that alternative could potentially cause direct and indirect, minor, long-term adverse effects on archaeological resources. Archaeological surveys of the proposed construction and mitigation areas at NAS Whidbey Island found archaeological sites in the vicinity; however, none of the proposed construction or mitigation activities at the installation are expected to impact these sites. Although there could be cumulative impacts on archaeological resources as a result of the EA-18G replacement, the P-8A MMA replacement, and the proposed NTRC, consultation with the SHPO and proposed mitigation measures would reduce any cumulative impacts to non-significant.

### **11.3 MCBH Kaneohe Bay**

#### **11.3.1 Installation Projects**

The Navy has evaluated the following action at MCBH Kaneohe Bay for potential cumulative impacts with the proposed P-8A MMA replacement action:

- Replacement of CH-53D aircraft with MV-22 aircraft at MCBH Kaneohe Bay; and
- Potential for increased air operations within the Hawaii Range Complex as a result of Navy and Marine Corps training operations.

#### **Replacement of CH-53D Aircraft with MV-22 Aircraft**

It is reasonably foreseeable that the U.S. Marines Corps will replace the CH-53D helicopter at MCBH Kaneohe Bay with the MV-22 Osprey tilt-rotor aircraft as part of the ongoing U.S. Marine Corps (USMC)-wide process of replacing its 1960s vintage fleet of medium-lift helicopters with more advanced, operationally capable aircraft. The initial operating capacity for the MV-22 at MCBH Kaneohe Bay is tentatively scheduled for 2016. For the purposes of this study

it is assumed that three squadrons of incoming MV-22 aircraft would replace the three squadrons of CH-53D helicopters currently stationed on the base. Under that scenario, a total of up to 36 MV-22 aircraft would replace the existing 36 CH-53D aircraft for a one-for-one replacement.

It is expected that the number of squadron personnel will remain virtually unchanged as a result of the transition from the CH-53D to the MV-22. Because no significant changes in personnel are projected due to the potential MV-22 action, no cumulative impacts on the local population and economy in the vicinity of MCBH Kaneohe Bay are expected as a result of this action. Additionally, it is expected that the number and type of air operations currently conducted by the CH-53D would continue to be conducted by the MV-22. Because the MV-22 replacement action is expected to take place by 2016, the projected air operations data and the 2019 noise zones for MCBH Kaneohe Bay discussed in Sections 8.1 and 8.2 do include projected MV-22 operations.

While the MV-22 replacement action may be reasonably foreseeable, the USMC has not yet initiated any specific facility planning or environmental planning documents for the potential transition at MCBH Kaneohe Bay. The USMC will conduct appropriate NEPA documentation to include updated noise contours, air emissions data, and cumulative impacts analysis prior to taking action to replace the CH-53D with the MV-22 at MCBH Kaneohe Bay.

The Marine Corps Aviation Plan is under review and may contain initiatives affecting MCBH Kaneohe Bay. If additional aircraft are homebased at MCBH Kaneohe Bay beyond the planned USMC MV-22 and Navy P-8A MMA squadrons, additional cumulative impacts would be expected because of the projected aircraft operations, personnel, and/or possible new construction required to support the added aircraft. As future Marine Corps initiatives are not yet ready for analysis (i.e., there is insufficient information about the scope of the contemplated initiatives), cumulative impacts of these potential actions cannot be assessed at this time. However, appropriate NEPA documentation will be initiated by either the Navy or the USMC, as appropriate, once the Marine Corps Aviation Plan, including the proposed “Grow the Force” initiative is formulated and reasonable siting alternatives are identified. Any additional growth at MCBH Kaneohe Bay may require alternative P-8A MMA siting locations at MCBH Kaneohe Bay and supplemental NEPA documentation.

### **Potential for Increased Air Operations within the Hawaii Range Complex**

The Navy is conducting an EIS to support current, future, and emerging training requirements within the Hawaii Range Complex surrounding the Hawaiian Islands. As part of the required air operations to support the training operations, the Navy has identified the potential for sporadic field carrier landing practices to be conducted by F/A-18 and other aircraft at MCBH Kaneohe Bay. Because of the sporadic and infrequent occurrence of F/A-18 operations at MCBH Kaneohe Bay, the Navy has determined that the action would have no significant adverse effect on biological and cultural resources as well as no significant impact on noise and air emissions. The Navy held consultations with applicable regulatory agencies, which led to a “not likely to adversely affect” determination for biological resources (as documented in Appendix E). The Navy determined that no increase in the overall noise contours and no change in designated APZs at MCBH Kaneohe Bay would result. Therefore, based on these factors, and considering that the replacement of the P-3C by the P-8A MMA results in a decrease in air operations of 10% from baseline conditions, no adverse cumulative effects would result from these air operations.

#### **11.3.2 Regional Projects**

As part of the cumulative impacts analysis, the Navy interviewed City and County of Honolulu Department of Planning and Permitting and Parks Department personnel (Senter 2008; Reid 2008) and reviewed the following community planning documents:

- Koolaupoko Sustainable Communities Plan;
- Annual Report on the Status of Land Use on Oahu, Fiscal Year 2006;
- Kahaluu Community Master Plan, Agency/AWG Draft February 2007; and
- Oahu Regional Transportation Plan 2030.

Based on interviews and review of the documents listed above, the Navy evaluated the following projects within the geographic boundary surrounding MCBH Kaneohe Bay for potential cumulative impacts of the proposed P-8A MMA replacement action:

- Construction of Ironwoods at Kailua (153 residential units total);
- Construction of The Woods at Ahuimanu (44 residential units total);
- Kualoa Regional Park infrastructure upgrades;
- Kaneohe Regional Town Center transportation improvements;

- Kamehameha Highway, Safety Improvements, Haleiwa to Kahaluu;
- Kamehameha Highway, Safety and Operational Improvements, Kaalaea Stream to Hygienic Store;
- Kahekili Highway, Widening, Kamehameha Highway to Haiku Road; and
- Likelike Highway, Widening, Kamehameha Highway to Kahekili Highway.

Two residential construction projects were identified during the Navy's review of community planning documents for the Koolaupoko planning region. The Ironwoods at Kailua development is scheduled to be completed in 2011 and will consist of a total of 153 residential units. The Woods at Ahuimanu development is currently on hold but, upon completion, would consist of a total of 44 residential units. Both residential projects would result in an increase in the local population as well as an increase in traffic on local roadways. However, because the P-8A MMA replacement action would result in a decrease in the local military population, there would be no cumulative impacts on traffic.

The planned Ironwoods at Kailua condominium project would be constructed on a site formerly occupied by an apartment complex. Because the site was previously developed, storm water runoff upon completion of Ironwoods at Kailua is not likely to significantly increase. Furthermore, because storm water from the site would drain into the Pacific Ocean off of Kailua, there would be no cumulative impacts on water quality from the proposed construction to support the P-8A MMA replacement action at MCBH Kaneohe Bay.

Infrastructure upgrades are proposed at Kualoa Regional Park, located at the northern end of Kaneohe Bay. These upgrades would include replacing the existing cavitette tank sewer system with a new central wastewater system. The design phase of this project is complete; however, construction has been put on hold due to the presence of native Hawaiian burials on the site. Once mitigation for these cultural resources is approved, the planned upgrades will be constructed (Reid 2008)

Multiple transportation projects were identified within the geographic boundary that could potentially result in cumulative impacts. The transportation projects identified in this analysis are summarized below:

- Kaneohe Regional Town Center transportation improvements include construction of municipal parking facilities, a transit center, and a pedestrian circulation system in the

Windward Shopping Mall and Kawa Street area. The proposed completion date for this project is uncertain.

- Kamehameha Highway, Safety Improvements, Haleiwa to Kahaluu, includes constructing various safety improvements (i.e., turn lanes, guardrails, signage, and crosswalks). Kamehameha Highway would be widened only where required for construction of storage areas and turn lanes. The proposed construction timeframe for this project is between 2006 and 2015.
- Kamehameha Highway, Safety and Operational Improvements, Kaalaea Stream to Hygienic Store, includes constructing safety and operational improvements (i.e., passing and turning lanes; signal modifications; and additional signs, flashers, and other warning devices). This project would also replace two bridges over Kaalaea Stream and Halamoa Stream with structures meeting current design standards. The proposed construction timeframe for this project is between 2006 and 2015.
- Kahekili Highway, Widening, Kamehameha Highway to Haiku Road would include widening Kahekili Highway from two to four lanes between Kamehameha Highway and Haiku Road. The proposed construction timeframe for this project is between 2016 and 2030.
- Likelike Highway, Widening, Kamehameha Highway to Kahekili Highway would include widening Likelike Highway from four to six lanes from Kamehameha Highway to Kahekili Highway. The proposed construction timeframe for this project is between 2016 and 2030.

### **11.3.3 Cumulative Impact Analysis**

#### **11.3.3.1 Noise**

##### **Description of Geographic Study Area**

The geographic boundary for MCBH Kaneohe Bay includes the towns of Kaneohe and Kailua.

##### **Cumulative Impact Assessment**

The noise impacts for all of the alternatives except Alternative 2 at MCBH Kaneohe Bay would increase when compared with baseline conditions. The projected 2019 65 dB DNL or greater noise contours for MCBH Kaneohe Bay primarily extend over the installation and water surrounding the installation. Coconut Island and a few other small uninhabited islands are the only land areas within the noise zones for MCBH Kaneohe Bay. Coconut Island serves as a marine research center for the University of Hawaii. While there may be a small number of staff and students present at the facility at any one time, they would be considered a temporary popu-

lation and are not included in the analysis for population within the projected noise contours at MCBH Kaneohe Bay. Since the projected noise contours are contained over water, military lands, or Coconut Island, no civilian residences would be located within the 65 dB DNL noise contours. Other proposed military projects have the potential to result in cumulative noise impacts; however, these future Marine Corps initiatives are not yet ready for analysis (i.e., there is insufficient information about the scope of the contemplated initiatives) so cumulative impacts cannot be assessed at this time.

#### **11.3.3.2 Socioeconomics**

##### **Description of Geographic Study Area**

The geographic boundary for MCBH Kaneohe Bay encompasses the towns of Kaneohe and Kailua.

##### **Cumulative Impact Assessment**

Under any one of the proposed alternatives associated with this action the number of personnel stationed or employed at MCBH Kaneohe Bay would decrease. The three potential population-loss scenarios range from 0.2% to 0.5% of the total county population. The small loss under these alternatives is not considered a significant impact, especially in the context of the overall growth the island of Oahu has experienced and is projected to experience in future years.

**Residential Projects.** The decrease in the number of military personnel stationed or employed at MCBH Kaneohe Bay would lessen the impact of the additional people that would inhabit the area as a result of the planned construction of 153 units at Ironwoods at Kailua and 44 units at The Woods at Ahuimanu.

#### **11.3.3.3 Storm Water**

##### **Description of Geographic Study Area**

The geographic boundary for MCBH Kaneohe Bay encompasses the portion of the city and county of Honolulu Koolaupoko planning region that drains into Kaneohe Bay. The Kaneohe Bay watershed covers approximately 11,500 acres and includes the area east of the Koolau Range from the town of Kaneohe (including the western part of MCBH Kaneohe Bay) northwest to Kualoa (Sustainable Resources Group International, Inc. 2002). The Kaneohe Bay

watershed provides a defined area in which to compare potential impacts on water quality in the bay resulting from the P-8A MMA replacement action and other identified projects within the watershed.

### **Cumulative Impact Assessment**

Construction of the facilities to support the basing of P-8A MMA at MCBH Kaneohe Bay would require a construction footprint of approximately 7 acres under Alternative 2 and approximately 6 acres under Alternatives 1 through 6. With proper mitigation, storm water runoff from the construction sites would not impact water quality in Kaneohe Bay. An individual NPDES permit for the discharge of storm water from construction activities would be required from the State of Hawaii Department because more than 1 acre would be disturbed. Under the permit, the Navy would submit a site-specific Storm Water Pollution Control Plan (SWPCP) (also referred to as a Storm Water Pollution Prevention Plan [SWPPP]) that would include a site plan for managing storm water runoff. The plan would also describe the BMPs to be implemented including: grass swales, silt fences, and berms.

Because Kaneohe Bay is classified as Class AA waters, the base's current NPDES permit (Permit No. HI 0110078) includes restrictions on the amount of storm water that may be discharged to the bay. Adverse impacts on Kaneohe Bay and other surface waters surrounding the station would be avoided to the greatest extent possible by implementing site-specific BMPs and other storm water management practices as specified in the base SWMP. As part of the SWMP, sampling is regularly conducted to ensure that storm water discharges meet state water quality standards.

**The Woods at Ahuimanu.** The Woods at Ahuimanu would be constructed on approximately 15 acres of undeveloped, vegetated land (Aguiar 2005). Upon completion of construction, storm water runoff from the site to Kaneohe Bay would increase. One lot (about 15,000 square feet) of the proposed residential development would remain vacant to be used as a catch basin for storm water (Aguiar 2005). Although the Woods at Ahuimanu and the P-8A MMA replacement project could result in cumulative impacts, mitigation measures would reduce the impact to non-significant.

**Various Transportation Projects.** The planned and proposed transportation projects identified in the list above could each potentially increase the amount and velocity of storm wa-

ter runoff in the Kaneohe Bay watershed. Most of the proposed new facilities at MCBH Kaneohe Bay would be sited on existing impervious surfaces and on-site BMPs would be used to reduce storm water runoff from the new construction sites. Although there could be cumulative impacts on water quality with local road-widening and transportation construction projects and the replacement of the P-8A MMA, impacts would not be significant because of the implementation of mitigation measures.

#### **11.3.3.4 Cultural Resources**

##### **Description of Geographic Study Area**

The study area for cultural resources is the city and county of Honolulu Koolau-poko planning region.

##### **Cumulative Impact Assessment**

The Navy has concluded that the proposed action would have no effect on historic resources at MCBH Kaneohe Bay. Consultation with the Hawaii SHPO and Native Hawaiian organizations consistent with the National Historic Preservation Act (NHPA) Section 106 consultation process was initiated in a letter dated August 30, 2007. The Navy sent a follow-up letter on September 11, 2008 including a determination that the proposed construction will not result in any adverse effect on historic properties.

One buried archaeological site was previously been identified in the area of the new P-8A MMA footprint. However, the surface above this site is currently an asphalted parking apron for aircraft. The P-8A MMA facilities plan proposes to continue using this area as a parking apron and no new construction will occur in the immediate vicinity of this archaeological site. In addition, the proposed P-8A MMA hangar and associated construction is located in zones with a medium potential for archaeological deposits. The Navy would complete an archaeological inventory survey with subsurface testing of these construction sites prior to construction to document the presence or absence of archaeological resources. The results of the archaeological inventory survey would be used to mitigate the potential effects the proposed undertaking may have on archaeological resources. For example, in the event archaeological resources are present, an attempt would be made to modify the construction footprint to avoid impacting the site. An archaeology work plan detailing monitoring and subsurface testing will be submitted to the De-



partment of Land and Natural Resources Office for review and concurrence. Following the evaluation, the Navy would continue its consultation with the Hawaii SHPO to obtain their concurrence on the findings and the appropriate determination of effects. Consultation with the Hawaii SHPO was initiated in a letter dated August 30, 2007. A follow-up letter detailing new project siting layouts was submitted on September 11, 2008. The Navy will continue to consult with the Hawaii SHPO and, based on any findings from the archaeological testing, will work with the Hawaii SHPO to mitigate any potential effects.

**Kualoa Regional Park Infrastructure Improvements.** Although the proposed action is not directly impacting Kualoa State Park and the project at Kualoa Regional Park is anticipated to be complete before the 2011 baseline, it is included in this analysis because the project involves disturbing cultural resources (Reid 2008). As part of the P-8A MMA replacement action at MCBH Kaneohe Bay, the Navy would conduct archaeological surveys of the proposed construction sites prior to construction to document the presence or absence of archaeological resources. In the event archaeological sites are present, an attempt would be made to modify the construction footprint to avoid impacting these sites. Following the survey, the Navy would continue its consultation with the Hawaii SHPO to obtain their concurrence on the findings and the appropriate determination of effects and any required mitigation. Although there could be cumulative impacts on cultural resources with the infrastructure upgrades at Kualoa Regional Park as a result of the P-8A MMA replacement and the proposed infrastructure upgrades at Kualoa Regional Park, consultation with the SHPO and proposed mitigation measures would reduce any cumulative impacts to non-significant.

#### **11.4 NAS North Island**

Cumulative impacts from the temporary detachments of P-8A MMA aircraft to NAS North Island would be negligible to nonexistent. The proposed action would mirror established training requirements by siting a temporary detachment of P-8A MMA at NAS North Island. An increase of only 17 personnel is expected and existing facilities are sufficient for hosting temporary detachments of the P-8A MMA. Because of the short detachment time at NAS North Island, the P-8A MMAs would not require their own hangar but would be parked on the existing aircraft parking apron and, therefore, no new construction would be required. Construction of training facilities and buildings to house aircraft simulators would not be required at this base.

## **12 Other Considerations**

### **12.1 Consistency with Other Federal, State, and Local Plans, Policies, and Regulations**

This section summarizes the laws, implementing regulations, and Executive Orders applicable to the proposed action. Where appropriate, the tables included below provide direction for further information on the impact analysis for potentially affected resources.

#### **National Environmental Policy Act (NEPA) (42 U.S.C. 4321, et seq.) and 33 CFR 755, Navy Procedures for Implementing the National Environmental Policy Act (NEPA)**

NEPA is the basic national charter for protection of the environment. It establishes policy, sets goals, and provides means for carrying out the policy. This EIS has been prepared in compliance with NEPA and 33 CFR 755. The EIS considers environmental consequences of the proposed action to provide facilities and functions to support the replacement of P-3C aircraft at maritime patrol homebases with P-8A MMA. The EIS was distributed to appropriate federal, state, and local agencies, organizations, and interested persons. Comments from these agencies and the public have been incorporated into the final EIS.

#### **Endangered Species Act (16 U.S.C. 1531, et seq.) and Fish and Wildlife Coordination Act (16 U.S.C. 661, et seq.)**

The Endangered Species Act was designed to prevent the extinction of native and foreign species of wild flora and fauna. The act defines an endangered species as any animal or plant in danger of extinction and a threatened species as any plant or animal likely to become extinct within the reasonably foreseeable future. This act makes it illegal to harass, harm, or kill listed species and to possess, transport, buy, or sell the species or parts thereof in the course of an interstate or foreign commercial activity. A permit authorizing any prohibited activity may be issued for the following: scientific research; educational purposes; enhancement or propagation or survival of the species; and incidental taking (not available for plants).

The National Defense Authorization Act of 2004 was enacted into law during the 108th Congress on November 24, 2003 (Public Law 108-136). Section 318 of the act, *Military*

*Readiness and Conservation of Protected Species*, amends the Endangered Species Act of 1973 by limiting the designation of critical habitat on any military lands that are already subject to an Integrated Natural Resources Management Plan (INRMP) if the INRMP provides a benefit to the species for which critical habitat is proposed. The amendment does not affect consultation requirements and does not allow the military to take an action that would harm an endangered or threatened species. The provision also does not affect current existing critical habitat areas.

The Navy has determined the potential effect on threatened and endangered species in construction areas for the replacement sites. Appropriate federal and state agencies were contacted. For information on impacts on threatened and endangered species under the various replacement alternatives, please refer to the chapters and sections listed in Table 12-1.

**Table 12-1 List of EIS Chapters Containing Information on Threatened and Endangered Species**

Florida – NAS Jacksonville	Chapter 4, Sections 4.11.2 and 4.11.3
Washington – NAS Whidbey Island	Chapter 6, Sections 6.11.2 and 6.11.3
Hawaii – MCBH Kaneohe Bay	Chapter 8, Sections 8.11.2 and 8.11.3
California – NAS North Island	Chapter 10, Sections 10.11.2 and 10.11.3

#### **Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1801, et seq.)**

This act governs the conservation and management of ocean fishing. The act established regional fishery management councils comprising federal and state officials, including the Fish and Wildlife Service. It became effective March 1, 1977 by establishing exclusive U.S. management authority over all fishing within the exclusive economic zone, all anadromous fish (species of fish that spawn in U.S. fresh or estuarine waters and migrate to ocean waters) throughout their migratory range except when in a foreign nation's waters, and all fish on the Continental Shelf. The act establishes eight Regional Fishery Management Councils responsible for the preparation of fishery management plans to achieve the optimum yield from U.S. fisheries in their regions. Congress amended the act extensively when it passed the Sustainable Fisheries Act in 1996. On January 12, 2007, the President signed the Magnuson-Stevens Fishery Conservation and Management Reauthorization Act of 2006.

The Navy has evaluated the potential for each site to adversely affect essential fish habitat. It has been concluded that there would be no effect on essential fish habitat at NAS

Jacksonville and NAS North Island. Consultations regarding effects on essential fish habitat have been concluded for NAS Whidbey Island and MCBH Kaneohe Bay and are discussed in Section 6.10 and 8.10 respectively (see Appendix E for agency correspondence).

### **Fish and Wildlife Coordination Act of 1996 (16 U.S.C. 661)**

Section 10 of the Fish and Wildlife Coordination Act directs federal agencies to consult with the U.S. Fish and Wildlife Service (USFWS), the National Oceanic and Atmospheric Administration (NOAA) Fisheries (formerly National Marine Fisheries Service), and state agencies before authorizing alterations to water bodies. None of the proposed relocation alternatives would involve direct alterations of any natural watercourses.

### **Clean Air Act (42 U.S.C. 7401, et seq.)**

This act dictates the National Ambient Air Quality Standards (NAAQS) that must be maintained nationwide. The act delegates authority to state and local agencies to enforce NAAQS and to establish air quality standards and regulations of their own. The adopted state standards and regulations must be at least as restrictive as the federal requirements.

In compliance with the Clean Air Act, potential impacts on air quality were evaluated for each of the alternatives. For information on impacts on regional and local air quality under the various replacement alternatives, please refer to the chapters and sections listed in Table 12-2 (see also Appendix H).

**Table 12-2 List of EIS Chapters Containing Information on Air Quality**

Florida – NAS Jacksonville	Chapter 4, Section 4.4
Washington – NAS Whidbey Island	Chapter 6, Section 6.4
Hawaii – MCBH Kaneohe Bay	Chapter 8, Section 8.4
California – NAS North Island	Chapter 10, Section 10.4

### **National Historic Preservation Act (16 U.S.C. 470 [f])**

The National Historic Preservation Act established historic preservation as a national policy and defined it as the protection, rehabilitation, restoration, and reconstruction of districts, sites, buildings, structures, and objects that are significant in American history, architecture, archaeology, or engineering. Section 106 of the National Historic Preservation Act requires federal agencies to take into account the effects of their undertakings on historic properties. It

requires federal agencies to preserve and use historic buildings “to the maximum extent feasible” and to have in place Section 106 compliance procedures.

In accordance with Section 106, the Navy has consulted with the appropriate State Historic Preservation Offices (SHPOs) regarding the effects on historic resources resulting from implementation of the preferred alternative. For information on impacts on cultural, archaeological, and historical resources under the various replacement alternatives, please refer to the chapters and sections listed in Table 12-3.

**Table 12-3 List of EIS Chapters Containing Information on Impacts on Cultural Resources**

Florida – <b>NAS Jacksonville</b>	Chapter 4, Section 4.12
Washington – <b>NAS Whidbey Island</b>	Chapter 6, Section 6.12
Hawaii – <b>MCBH Kaneohe Bay</b>	Chapter 8, Section 8.12
California – <b>NAS North Island</b>	Chapter 10, Section 10.12

**Clean Water Act (33 U.S.C. 1251, et seq.) and Executive Order (EO) 11990, Protection of Wetlands, May 24, 1977**

The Clean Water Act established the basic structure for regulating discharges of pollutants into the waters of the United States. The Clean Water Act also continued requirements to set water quality standards for all contaminants in surface waters and made it unlawful for any person to discharge any pollutant from a point source into navigable waters unless a permit was obtained under its provisions. This statute specifies permitting requirements for discharges of wastewater and storm water to waters of the United States under the National Pollutant Discharge Elimination System (NPDES)—delegated by individual states—and for the protection of ambient water quality. It also specifies permitting requirements for dredging and filling of wetlands (Section 404), a program administered by the U.S. Army Corps of Engineers (USACE) and the individual state regulatory authority and U.S. Environmental Protection Agency (EPA) oversight. Section 401 deals with water quality issues.

In compliance with the Clean Water Act and Executive Order 11990, development in wetland areas has been avoided to the extent practicable. The proposed replacement alternatives at NAS Jacksonville, NAS North Island, and MCBH Kaneohe Bay would have no direct or indirect effect on wetlands. Some unavoidable wetland impacts would occur at NAS Whidbey Island. Accordingly, the Navy is coordinating with the USACE and the Washington State

Department of Ecology to obtain the necessary permits and approval for any unavoidable impacts on wetlands and associated mitigation. For information on impacts on wetlands under the various replacement alternatives, please refer to the chapters and sections listed in Table 12-4.

**Table 12-4 List of EIS Chapters Containing Information on Impacts on Wetlands**

Florida – <b>NAS Jacksonville</b>	Chapter 4, Section 4.10
Washington – <b>NAS Whidbey Island</b>	Chapter 6, Section 6.10
Hawaii – <b>MCBH Kaneohe Bay</b>	Chapter 8, Section 8.10
California – <b>NAS North Island</b>	Chapter 10, Section 10.10

### **Coastal Zone Management Act (16 U.S.C. 1451, et seq.)**

The Coastal Zone Management Act, as amended, provides for preservation, protection, development, and, where feasible, restoration or enhancement of the nation's coastal zone. As required by Section 307 (c) of the Coastal Management Act, the proposed action must be consistent with the approved Florida, Washington, California, and Hawaii Coastal Management Programs to the maximum extent possible.

The Navy's Coastal Consistency Determinations (CCD) for NAS Jacksonville, NAS Whidbey Island, and MCBH Kaneohe Bay are located in Appendix J. A CCD for NAS North Island has not been prepared because the proposed action at this installation would have no direct or indirect effects on coastal resources.

### **Safe Drinking Water Act of 1974 (42 U.S.C. 300f, et seq.)**

This act sets forth a classification system for groundwater used for potable water supply and specifies requirements for the quality of groundwater that can be used for water supply. The implementation of the Safe Drinking Water Act is delegated to the states.

### **Resource Conservation and Recovery Act (RCRA) (42 U.S.C. 6901, et seq.)**

Subchapter III sets forth hazardous waste management provisions; Subchapter IV sets forth solid waste management provisions; and Subchapter IX sets forth underground storage tank provisions with which federal agencies must comply.

**Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (42 U.S.C. 9601, et seq.)**

This act establishes the liability and responsibilities of federal agencies for emergency response measures and remediation when hazardous substances are known to have been released into the environment.

Proposed construction projects at the alternative homebasing locations for the P-8A MMA were reviewed in reference to the locations of the Installation Restoration Program (IRP) sites. It has been concluded there would be no involvement with existing IRP sites, munitions program sites, or long-term monitoring protocols for these sites under any homebasing alternative. For information on impacts on IRP sites under the various replacement alternatives, please refer to the chapters and sections listed in Table 12-5.

**Table 12-5 List of EIS Chapters Containing Information on Impacts on IRP Sites**

Florida – NAS Jacksonville	Chapter 4, Section 4.13
Washington – NAS Whidbey Island	Chapter 6, Section 6.13
Hawaii – MCBH Kaneohe Bay	Chapter 8, Section 8.13
California – NAS North Island	Chapter 10, Section 10.13

**Sikes Act Improvement Act of 1997 (16 U.S.C. 670)**

In November 1997, the Sikes Act was amended to require the Secretary of Defense to carry out a program to provide for the conservation and rehabilitation of natural resources on military installations.

**Federal Aviation Act of 1958 (49 U.S.C. 1301, et seq.)**

This legislation created the Federal Aviation Administration (FAA) and charged the agency's administrator with ensuring the safety of aircraft and the efficient utilization of navigable airspace within the jurisdiction of the United States.

**Outleasing for Grazing and Agriculture on Military Lands, as amended (10 U.S.C. 2667)**

This legislation establishes procedures for outleasing and grazing programs on military lands.

**Hunting, Fishing, and Trapping on Military Lands (10 U.S.C. 2671)**

This legislation establishes procedures for hunting, fishing, and trapping programs on military lands.

**Outdoor Recreation on Federal Lands (16 U.S.C. 460)**

This legislation establishes procedures for outdoor recreation programs on military lands.

**Timber Sales on Military Land 10 (U.S.C. 2665)**

This legislation establishes procedures for timber programs on military lands.

**Federal Noxious Weed Act of 1970 (7 U.S.C. 2803 and 2809)**

This legislation establishes the control and eradication of noxious weeds and regulates them in interstate and foreign commerce.

**Migratory Bird Treaty Act (16 U.S.C. 701-715s)**

The MBTA of 1918 is the primary legislation in the United States established to conserve migratory birds. It implements the United States' commitment to four bilateral treaties, or conventions, for the protection of a shared migratory bird resource. The MBTA prohibits the taking, killing, or possessing of migratory birds unless permitted by regulation. The species of birds protected by the MBTA appear in Title 50, Section 10.13, of the Code of Federal Regulations (50 CFR 10.13). On December 2, 2003, the President signed the 2003 National Defense Authorization Act. The act states that the Secretary of the Interior shall exercise authority under the MBTA to prescribe regulations to exempt the Armed Forces from incidental taking of migratory birds during military readiness activities authorized by the Secretary of Defense. The regulation must have concurrence from the Secretary of Defense. The proposed rule authorizing the Department of Defense to take migratory birds during military readiness activities was published in the *Federal Register* on June 2, 2004. The final rule became effective March 30, 2007.

**Executive Order 13186, Responsibilities of Federal Agencies to Protect Migratory Birds, January 10, 2001**

This order requires federal agencies to support the conservation intent of migratory bird conventions by integrating bird-conservation principles, measures, and practices into agency



activities and by avoiding or minimizing adverse impacts on migratory bird resources and to minimize the intentional take of species of concern.

The Navy has evaluated the potential for each site to adversely affect migratory birds. It has been concluded there would be a negligible effect on migratory birds under any replacement alternative. For information on impacts on migratory birds under the various replacement alternatives, please refer to the chapters and sections listed in Table 12-6.

**Table 12-6 List of EIS Chapters Containing Information on Impacts on Migratory Birds**

Florida – NAS Jacksonville	Chapter 4, Section 4.11.2
Washington – NAS Whidbey Island	Chapter 6, Section 6.11.2
Hawaii – MCBH Kaneohe Bay	Chapter 8, Section 8.11.2
California – NAS North Island	Chapter 10, Section 10.11.2

**Bald and Golden Eagle Protection Act. (16 U.S.C. §§ 668-668d, June 8, 1940, as amended 1959, 1962, 1972, and 1978).**

The BGEPA prohibits the taking or possession of or commerce in bald and golden eagles, with limited exceptions. “Taking” includes pursuing, shooting, shooting at, poisoning, wounding, killing, capturing, trapping, collecting, molesting, or disturbing. “Commerce” would include selling, purchasing, bartering, or transporting, i.e., conveying or carrying by any means or delivering or receiving for conveyance (§ 668c). The 1972 amendments increased penalties for violating provisions of the BGEPA or regulations issued pursuant thereto and strengthened other enforcement measures. Rewards are provided for information leading to arrest and conviction for violation. The 1978 amendment authorizes the Secretary of the Interior to permit the taking of golden eagle nests that interfere with resource development or recovery operations (see also the Migratory Bird Treaty Act and the Endangered Species Act).

**Energy Independence and Security Act of 2007 (signed on Dec 19, 2007)**

Title IV, Subtitle C, Section 438 provides that “the sponsor of any development or redevelopment project involving a Federal facility with a footprint that exceeds 5,000 square feet shall use site planning, design, construction, and maintenance strategies for the property to maintain or restore, to the maximum extent technically feasible, the predevelopment hydrology of the property with regard to the temperature, rate, volume, and duration of flow.” This provision should increase focus on low impact development (LID) in federal development

projects and, as a consequence, help foster increased use, technical improvements, and potential cost reductions for LID practices nationwide.

**Emergency Planning and Community Right-to-Know Act (EPCRA) of 1986  
(42 U.S.C. 11001 to 11050)**

This act provides for notification procedures when a release of a hazardous substance occurs, sets up community response measures to a hazardous substance release, and establishes inventory and reporting requirements for toxic substances at all facilities.

**Pollution Prevention Act of 1990 (42 U.S.C. 13101 to 13109)**

This act establishes source reduction as the preferred method of pollution prevention, followed by recycling, treatment, and then disposal into the environment. It also establishes reporting requirements to submit with EPCRA reports. Federal agencies must comply.

**Executive Order 11990, Protection of Wetlands, May 24, 1977**

This order requires federal agencies to avoid to the extent possible the long- and short-term adverse impacts associated with the destruction or modification of wetlands and to avoid direct or indirect support of new construction in wetlands wherever there is a practicable alternative.

**Executive Order 11988, Floodplain Management, as amended by Executive Order 12148, July 20, 1979**

This order requires federal service agencies to avoid activities directly or indirectly resulting in development of floodplain areas. In accordance with Executive Order 11988, the Navy examined proposed construction projects that would occur within floodplain areas and avoided them or proposed mitigation measures to prevent associated impacts.

**Executive Order 13045, Protection of Children from Environmental Health Risks and Safety Risks, as amended by Executive Order 13229, October 9, 2001**

This order requires federal agencies to examine policies, programs, and activities potentially posing disproportionate environmental health and safety risks to children. In accordance with Executive Order 13045, federal agencies need to ensure that policies, programs,

and activities address environmental health and safety risks to identify any disproportionate risks to children. The Navy reviewed scientific literature on the effects of aircraft noise on children. The research reviewed suggests that environments with sustained high background noise can have variable effects on learning and cognitive abilities and reports various noise-related physiological changes (see Appendix F).

**Executive Order 12898, Federal Actions to Address Environmental Justice in Minority and Low Income Populations, as amended by Executive Order 12948, January 30, 1995**

Consistent with Executive Order 12898, it is the Navy's policy to identify and address disproportionately high and adverse human health or environmental effects of actions on minority and low-income populations. The Navy's policy on environmental justice recommends the following:

- Ensure that all programs or activities under its control receiving federal financial assistance and that affect human health or the environment do not directly or indirectly use criteria, methods, or practices that discriminate on the basis of race, color, or national origin;
- Analyze the human health, economic, and social effects of Department of the Navy actions, including effects on minority and low-income communities, when such analysis is required under NEPA;
- Ensure, whenever feasible, that mitigation measures outlined or analyzed in NEPA documentation address significant and adverse environmental effects of proposed federal actions on minority and low-income communities;
- Ensure that opportunities for community input in the NEPA process are provided, including identifying potential effects and mitigation measures in consultation with affected communities, and improve the accessibility of meetings, crucial documents, and notices; and
- Ensure that the public, including minority communities and low-income communities, has adequate access to public information relating to human health or environmental planning, regulation, and enforcement.

Criteria, methods, and practices used in the preparation of this EIS to evaluate the significance of impacts resulting from the proposed action do not discriminate either directly or indirectly on the basis of income, race, color, or national origin. This environmental justice analysis was conducted assuming that:

- Adverse impacts would result from aircraft noise, and
- The alternatives that would result in the largest number of individuals exposed to the greater-than-65 dB DNL noise contour present the worst-case analysis.

Environmental justice impacts under each alternative are discussed in Chapters 4, 6, 8, and 10. The sections include tables listing census tracts that would be located within the greater-than-65 decibel (dB) day-night average sound level (DNL) noise contours under the alternatives that would result in the largest number of individuals exposed to the greater-than-65 dB DNL noise contour. Figures are presented to depict census tracts wholly or partially within projected and modeled DNL noise zones for the alternatives that would result in the largest number of individuals exposed to the greater-than-65 dB DNL noise contour.

### **Analysis of Minority Populations**

The White House Office of Environmental Justice defines minority populations as “individuals who are Black/African-American, Hispanic, Asian, Pacific Islander, American Indian, Eskimo, Aleut, or other non-white persons.” The Office of Environmental Justice indicates that for populations to be considered minority, the minority composition should either exceed 50% or be greater than the minority population percentage of the general population for the geographic area under analysis. The appropriate unit of analysis may be a governing body’s jurisdiction, a neighborhood, a census tract, or other similar unit.

### **Analysis of Low-Income Populations**

The Council on Environmental Quality (1997) defines low-income populations as populations considered by the U.S. Census Bureau to be “below poverty level.” For purposes of the analyses in this EIS, the U.S. Census Bureau data was used to assess low-income populations.

### **Minority and Low-Income Population Access to Public Information**

One goal of Executive Order 12898 is to provide minority communities and low-income communities with access to public information on and an opportunity for public participation in matters relating to human health or the environment.

For information on impacts on socioeconomic resources (local economy, housing, minority populations, etc.) under the various replacement alternatives, please refer to the chapters and sections listed in Table 12-7.

## **12.2 Required Permits, Approvals, and Consultations**

A list of federal and state permits and agency approvals required for implementation of the proposed action under each of the alternatives is included in Table 12-8.

**Table 12-7 List of EIS Chapters Containing Information on Impacts on Socioeconomic Resources**

Florida – NAS Jacksonville	Chapter 4, Section 4.5
Washington – NAS Whidbey Island	Chapter 6, Section 6.5
Hawaii – MCBH Kaneohe Bay	Chapter 8, Section 8.5
California – NAS North Island	Chapter 10, Section 10.5

## **12.3 Unavoidable Adverse Impacts and Considerations that Offset these Impacts**

Unavoidable adverse impacts would vary by aircraft replacement sites and replacement alternatives. Adverse impacts are discussed in the environmental consequences section for each replacement site and are summarized below.

Construction of support facilities under all alternatives would generate minor impacts on soils, vegetation, wildlife, and air quality. These impacts would be short-term or minor, and using standard best management practices would minimize potential impacts.

### **12.3.1 Alternative 1**

Alternative 1 would homebase six fleet squadrons and a fleet replacement squadron (FRS) at NAS Jacksonville, three fleet squadrons at NAS Whidbey Island, three fleet squadrons at MCBH Kaneohe Bay, and a periodic squadron detachment at NAS North Island. Although the number of projected annual aircraft operations would decrease at NAS Jacksonville, NAS Whidbey Island, and MCBH Kaneohe Bay, noise levels would increase. Compared with 2011 baseline conditions, the population within the greater-than-65 dB DNL noise zones would increase by approximately 1,079 people, or 175%, near NAS Jacksonville and 597 people, or 7%, near NAS Whidbey Island. No additional people would be exposed to increased noise

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**Table 12-8 Required Permits and Approvals**

			Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6
<b>Federal</b>								
USFW ESA Section 7 Consultation	U.S. Fish and Wildlife Service	Effect determination on threatened and endangered species	X	X	X	X	X	X
NMFS ESA Section 7 Consultation	National Marine Fisheries Service	Effect determination on threatened and endangered species	X	X	X	X	X	X
Section 404 of the Clean Water Act (33 U.S.C. §1251, et seq.)	U.S. Army Corps of Engineers	Impacts on jurisdictional wetlands (NAS Whidbey Island)	X	X	X	X	X	X
Objects Affecting Navigable Airspace (14 CFR 77)	Federal Aviation Authority	Notice of proposed construction forms 7460-1 and 7460-2 (NAS Jacksonville, NAS Whidbey Island, and MCBH Kaneohe Bay)	X	X	X	X	X	X
<b>State of Florida (NAS Jacksonville)</b>								
St. John's River Water Management District	Office of the Governor of the State of Florida	Any construction above 4,000 square feet impervious surface area	X	X	X	X	X	X
Coastal Consistency Determination	Florida Department of Community Affairs	Activities affecting the coastal zone	X	X	X	X	X	X
NPDES Construction Stormwater General Permit	Florida Department of Environmental Protection	Ground disturbance exceeding 1 acre	X	X	X	X	X	X
Section 106 Review (National Historic Preservation Act, §106, 16 USC 470 et seq.)	Department of State, Division of Cultural Resources	Ground disturbance	X	X	X	X	X	X
<b>State of Washington (NAS Whidbey Island)</b>								
Coastal Consistency Determination	Washington Department of Ecology	Activities affecting the coastal zone	X	X	X	X	X	X
Section 401 Water Quality Certification	Washington Department of Ecology	Impacts on jurisdictional wetlands	X	X	X	X	X	X
NPDES Construction Stormwater General Permit	Washington Department of Ecology	Ground disturbance exceeding 1 acre	X	X	X	X	X	X
Section 106 Review (National Historic Preservation Act, §106, 16 USC 470 et seq.)	Washington State Department of Archaeology and Historic Preservation	Ground disturbance	X	X	X	X	X	X
<b>State of Hawaii (MCBH Kaneohe Bay)</b>								
Coastal Consistency Determination	Office of State Planning	Activities affecting the coastal zone	X	X	X	X	X	X
NPDES Construction Stormwater General Permit	Hawaii Department of Health	Ground disturbance exceeding 1 acre	X		X	X	X	X
Section 106 Review (National Historic Preservation Act, §106, 16 USC 470 et seq.)	Hawaii State Department of Land and Natural Resources, Historic Preservation Division	Ground disturbance	X		X	X	X	X

levels near MCBH Kaneohe Bay because the off-base noise increase would be located entirely over water or uninhabited land.

The number of personnel stationed or employed at NAS Jacksonville, NAS Whidbey Island, and MCBH Kaneohe Bay would decrease under Alternative 1. Loss of personnel and payroll would have an adverse impact on the regional economies surrounding the installations. The total losses of annual earnings are estimated at \$250.8 million in the Jacksonville region; \$78.3 million in Island County, Washington, and \$93.5 million in Honolulu County, Hawaii.

Construction of support facilities at NAS Whidbey Island under Alternative 1 would cause the permanent loss of approximately 0.2 acres of wetlands. Impacts on wetlands would be offset by incorporating wetland avoidance and minimization measures into final facility designs and by using best management practices during construction. In addition, wetland mitigation would be completed in accordance with permits from the USACE and the Washington Department of Ecology.

### **12.3.2 Alternative 2**

Alternative 2 would homebase five fleet squadrons and the FRS at NAS Jacksonville, seven fleet squadrons at NAS Whidbey Island, a permanent squadron detachment at MCBH Kaneohe Bay, and a periodic squadron detachment at NAS North Island. Although the number of projected annual aircraft operations would decrease at NAS Jacksonville and MCBH Kaneohe Bay, noise levels would increase. Additionally, both the number of projected annual aircraft operations and noise levels would increase at NAS Whidbey Island. Compared with 2011 baseline conditions, the population within the greater-than-65 dB DNL noise zones would increase by approximately 685 people, or 111%, near NAS Jacksonville and 619 people, or 7%, near NAS Whidbey Island. No additional people would be exposed to increased noise levels near MCBH Kaneohe Bay because the off-base noise increase would be located entirely over water or uninhabited land.

The number of personnel stationed or employed at NAS Jacksonville and MCBH Kaneohe Bay would decrease under Alternative 2. Loss of personnel and payroll would have an adverse impact on the regional economies surrounding the installations. The total losses of annual earnings are estimated at \$285.9 million in the Jacksonville region and \$239.6 million in Honolulu County, Hawaii.

The loss of personnel at MCBH Kaneohe Bay would cause a 17.3% decrease in the number of school-aged children within the Kalaheo Complex of the Hawaii Department of Education. While the overall impact on individual schools is difficult to quantify, impacts on the school district could be significant and adjustments in the schools that children attend may need to be addressed to maintain efficient levels of capacity and teacher-to-student ratios.

Construction of support facilities at NAS Whidbey Island under Alternative 2 would cause the permanent loss of approximately 6.8 acres of wetlands. Impacts on wetlands would be offset by incorporating wetland avoidance and minimization measures into final facility designs and by using best management practices during construction. In addition, wetland mitigation would be completed in accordance with permits from the USACE and the Washington Department of Ecology.

### **12.3.3 Alternative 3**

Alternative 3 would homebase five fleet squadrons and the FRS at NAS Jacksonville, five fleet squadrons at NAS Whidbey Island, two fleet squadrons at MCBH Kaneohe Bay, and a periodic squadron detachment at NAS North Island. The number of projected annual aircraft operations would decrease at NAS Jacksonville, NAS Whidbey Island, and MCBH Kaneohe Bay. The area within the greater-than-65 dB DNL noise zones would increase at NAS Jacksonville and NAS Whidbey Island and decrease at MCBH Kaneohe Bay. Compared with 2011 baseline conditions, the population within the greater-than-65 dB DNL noise zones would increase by approximately 685 people, or 111%, near NAS Jacksonville and 610 people, or 7%, near NAS Whidbey Island. No additional people would be exposed to increased noise levels near MCBH Kaneohe Bay because the off-base noise increase would be located entirely over water or uninhabited land.

The number of personnel stationed or employed at NAS Jacksonville and MCBH Kaneohe Bay would decrease under Alternative 3. Loss of personnel and payroll would have an adverse impact on the regional economies surrounding the installations. The total losses of annual earnings are estimated at \$285.9 million in the Jacksonville region and \$138.7 million in Honolulu County, Hawaii. Although the number of personnel stationed or employed at NAS Whidbey Island would decrease slightly under Alternative 3, total annual earnings would increase by approximately \$20.6 million in Island County, Washington. The increase in total



earnings with an overall loss of personnel is due to an overall change to higher-ranked personnel who earn more individually.

The loss of personnel at MCBH Kaneohe Bay would cause a 10.1% decrease in the number of school-aged children within the Kalaheo Complex of the Hawaii Department of Education. While the overall impact on individual schools is difficult to quantify, impacts on the school district could be significant and adjustments in the schools that children attend may need to be addressed to maintain efficient levels of capacity and teacher-to-student ratios.

Construction of support facilities at NAS Whidbey Island under Alternative 3 would cause the permanent loss of approximately 2.5 acres of wetlands. Impacts on wetlands would be offset by incorporating wetland avoidance and minimization measures into final facility designs and by using best management practices during construction. In addition, wetland mitigation would be completed in accordance with permits from the USACE and Washington Department of Ecology.

#### **12.3.4 Alternative 4**

Alternative 4 would homebase five fleet squadrons at NAS Jacksonville, five fleet squadrons and the FRS at NAS Whidbey Island, two fleet squadrons at MCBH Kaneohe Bay, and a periodic squadron detachment at NAS North Island. The number of projected annual aircraft operations would increase at NAS Whidbey Island and decrease at NAS Jacksonville and MCBH Kaneohe Bay. The area within the greater-than-65 dB DNL noise zone would increase at NAS Whidbey Island and Jacksonville and decrease at MCBH Kaneohe Bay. Compared with 2011 baseline conditions, the population within the greater-than-65 dB DNL noise zones would increase by approximately 621 people, or 37%, near NAS Jacksonville and 621 people, or 7%, near NAS Whidbey Island. No additional people would be exposed to increased noise levels near MCBH Kaneohe Bay because the off-base noise increase would be located entirely over water or uninhabited land.

The number of personnel stationed or employed at NAS Jacksonville and MCBH Kaneohe Bay would decrease under Alternative 4. Loss of personnel and payroll would have an adverse impact on the regional economies surrounding the installations. The total losses of annual earnings are estimated at \$328.4 million in the Jacksonville region and \$138.7 million in Honolulu County, Hawaii.

The loss of personnel at MCBH Kaneohe Bay would cause a 10.1% decrease in the number of school-aged children within the Kalaheo Complex of the Hawaii Department of Education. While the overall impact on individual schools is difficult to quantify, impacts on the school district could be significant and adjustments in the schools that children attend may need to be addressed to maintain efficient levels of capacity and teacher-to-student ratios.

Construction of support facilities at NAS Whidbey Island under Alternative 4 would cause the permanent loss of approximately 6.7 acres of wetlands. Impacts on wetlands would be offset by incorporating wetland avoidance and minimization measures into final facility designs and by using best management practices during construction. In addition, wetland mitigation would be completed in accordance with permits from the USACE and Washington Department of Ecology.

#### **12.3.5 Alternative 5 (Preferred Alternative)**

Alternative 5 would homebase five fleet squadrons and the FRS at NAS Jacksonville, four fleet squadrons at NAS Whidbey Island, three fleet squadrons at MCBH Kaneohe Bay, and a periodic squadron detachment at NAS North Island. Although the number of projected annual aircraft operations would decrease at NAS Jacksonville, NAS Whidbey Island, and MCBH Kaneohe Bay, noise levels would increase. Compared with 2011 baseline conditions, the population within the greater-than-65 dB DNL noise zones would increase by approximately 685 people, or 111%, near NAS Jacksonville and 605 people, or 7%, near NAS Whidbey Island. No additional people would be exposed to increased noise levels near MCBH Kaneohe Bay because the off-base noise increase would be located entirely over water or uninhabited land.

The number of personnel stationed or employed at NAS Jacksonville, NAS Whidbey Island, and MCBH Kaneohe Bay would decrease under Alternative 5. Loss of personnel and payroll would have an adverse impact on the regional economies surrounding the installations. The total losses of annual earnings are estimated at \$285.9 million in the Jacksonville region; \$28.8 million in Island County, Washington, and \$93.5 million in Honolulu County, Hawaii.

Construction of support facilities at NAS Whidbey Island under Alternative 5 would cause the permanent loss of approximately 0.2 acres of wetlands. Impacts on wetlands would be offset by incorporating wetland avoidance and minimization measures into final facility designs and by using best management practices during construction. In addition, wetland mitigation

would be completed in accordance with permits from the USACE and the Washington Department of Ecology.

### **12.3.6 Alternative 6**

Alternative 6 would homebase five fleet squadrons at NAS Jacksonville, four fleet squadrons and the FRS at NAS Whidbey Island, three fleet squadrons at MCBH Kaneohe Bay, and a periodic squadron detachment at NAS North Island. Although the number of projected annual aircraft operations would decrease at NAS Jacksonville and MCBH Kaneohe Bay, noise levels would increase. Additionally, both the number of projected annual aircraft operations and noise levels would increase at NAS Whidbey Island. Compared with 2011 baseline conditions, the population within the greater-than-65 dB DNL noise zones would increase by approximately 228 people, or 37%, near NAS Jacksonville and 616 people, or 7%, near NAS Whidbey Island. No additional people would be exposed to increased noise levels near MCBH Kaneohe Bay because the off-base noise increase would be located entirely over water or uninhabited land.

The number of personnel stationed or employed at NAS Jacksonville and MCBH Kaneohe Bay would decrease under Alternative 6. Loss of personnel and payroll would have an adverse impact on the regional economies surrounding the installations. The total losses of annual earnings are estimated at \$328.4 million in the Jacksonville region and \$93.5 million in Honolulu County, Hawaii. Although the number of personnel stationed or employed at NAS Whidbey Island would decrease slightly under Alternative 6, total annual earnings would increase by approximately \$13.7 million in Island County, Washington. The increase in total earnings with an overall loss of personnel is due to an overall change to higher-ranked personnel who earn more individually.

Construction of support facilities at NAS Whidbey Island under Alternative 6 would cause the permanent loss of approximately 2.1 acres of wetlands. Impacts on wetlands would be offset by incorporating wetland avoidance and minimization measures into final facility designs and by using best management practices during construction. In addition, wetland mitigation would be completed in accordance with permits from the USACE and Washington Department of Ecology.

## **12.4 Relationships between Short-Term Uses of the Environment and Enhancement of Long-Term Productivity**

Short-term uses of the environment associated with the proposed action would include changes to the physical environment and energy and utility use during the construction of administrative, training, and other facilities to support the P-8A MMA. Construction would involve short-term increases in fugitive dust emissions and construction-generated noise and increase the use of fossil fuels to power construction equipment. In addition, expenditures of public funds/resources and the use of labor would be required. Long-term changes would include an increase in noise levels and alterations to land uses that would exist for the life of the facility.

The P-8A MMA would result in long-term productivity improvements in performance, training, and, ultimately, defending the United States. The introduction of this aircraft into the U.S. Navy Fleet would meet the need of Naval aviation for a next-generation Navy maritime patrol aircraft with increased combat capability and enhanced system efficiency.

## **12.5 Irreversible and Irretrievable Commitments of Resources**

Irreversible and irretrievable resource commitments are related to the use of nonrenewable resources and the effects that the uses of these resources have on future generations. An irreversible effect primarily results from the use or destruction of a specific resource (e.g., energy or minerals) that cannot be replaced within a reasonable timeframe. The implementation of the proposed action would not result in long-term irreversible or irretrievable commitments of resources. Only a short-term irreversible commitment of resources would occur including use of energy resources and utilities during construction, generation of fugitive dust emissions, and creation of temporary construction noise.

Irretrievable commitments of resources are those resources that would be lost for a period of time—in this case, the life of the facilities. Irretrievable commitments of resources associated with the proposed action would result in the loss of wetlands at NAS Whidbey Island under all alternatives. Impacts on wetlands would be minimized, and mitigation measures have been incorporated into the proposed action to reduce impacts. Appropriate permits would be secured, but impacts would still occur.

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